

## Resurrection of the Pronotocrepini Knight, with Revisions of the Nearctic Genera *Orectoderus* Uhler, *Pronotocrepis* Knight, and *Teleorhinus* Uhler, and Comments on the Palearctic *Ethelastia* Reuter (Heteroptera: Miridae: Phylinae)

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### ABSTRACT

The Nearctic genera *Orectoderus* Uhler, *Pronotocrepis* Knight, and *Teleorhinus* Uhler are revised. One new species from Texas, *Teleorhinus crataegi*, sp. nov., is described. *Teleorhinus oregoni* Knight, 1968 is transferred to *Orectoderus* Uhler. The following new synonyms are proposed (senior synonym first): *O. arcuatus* Knight = *O. schuhi* Knight; *O. montanus* Knight = *O. utahensis* Knight, *O. salicis* Knight, and *O. cockerelli* Knight; *O. obliquus* Uhler = *O. ruckesi* Knight; *P. clavicornis* Knight = *P. ribesi* Knight and *P. ruber* Knight; *T. cyaneus* Uhler = *T. brindleyi* Knight and *T. nigricornis* Knight; *T. tephrosicola* Knight = *T. floridanus* Blatchley and *T. utahensis* Knight; *O. bakeri* Knight = *T. oregoni* Knight. *Orectoderus* and *Teleorhinus* are transferred from the Halodapini Van Duzee to the Pronotocrepini Knight. The Palearctic genus *Ethelastia* Reuter, 1876, is reviewed and transferred from the Phylini to the Pronotocrepini.

A rediagnosis for the tribe Pronotocrepini, a key to the included genera, keys to males and females, illustrations of male and female genitalia, except for the female of *Teleorhinus crataegi*, new species, dorsal habitus photographs, scanning micrographs of selected structures, and new locality and host-plant records are included for all species.

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## INTRODUCTION

The systematic position of *Orectoderus* Uhler, 1876, *Pronotocrepis* Knight, 1929, and *Teleorhinus* Uhler, 1890, within the Phylinae is controversial. Reuter (1910) placed *Orectoderus* in the Cremnocephalaria and *Teleorhinus* among genera incertae sedis. Subsequently *Orectoderus* and *Teleorhinus* were transferred to the Hallodapini Van Duzee, 1916 (Knight, 1923, 1968a; Carvalho, 1952, 1958). Knight (1929) erected the tribe Pronotocrepini for his new monotypic genus *Pronotocrepis*. Carvalho (1952) transferred *Pronotocrepis* to the tribe Phylini, a placement maintained in Schuh (1995, 2008). The Palearctic *Ethelastia* Reuter, 1876, was always considered a member of the tribe Phylini (Konstantinov, 2008).

The present paper revises these three Nearctic genera, reviews the recently revised Palearctic genus *Ethelastia*, and attributes all four to the Pronotocrepini. Diagnoses and redescriptions of all genera and species, keys to genera and to males and females of several species, and detailed locality and host information are provided.

In addition to present study, Konstantinov (2008) made a detailed revision of the Palearctic genus *Ethelastia* and described a new species. Konstantinov (2008) provided a revised diagnosis of *Ethelastia*, descriptions of the genus and species, new locality and host-plant records, measurements, illustrations of male genitalia, head, pretarsi, and tarsi, dorsal habitus photographs of males and females, and a distribution map. Complementary to Konstantinov's (2008) work the female genitalia of *E. liturata* are documented in the present work.

## MATERIAL AND METHODS

All measurements are in millimeters; see tables 1–3 for measurements of all Nearctic species. The females of *Orectoderus* species are distinctly bent (fig. 3). To take the measurements the specimens were oriented in such a way that the pronotum plus the abdomen were in a horizontal position.

The listed host-plant information is derived from host labels of the investigated adult specimens. The plant classification follows Mabberley (1997).

During the course of this study unique specimen identifiers (USIs) in the form of bar code labels were affixed to the specimens. This code comprises a project abbreviation followed by a unique number, e.g., AMNH\_PBI 00121395. The AMNH\_PBI portion of the code has been eliminated from all specimen data except primary types in order to conserve space. For this study almost 2,000 specimens were examined and more than 120 genitalic dissections were made.

## INSTITUTIONAL ABBREVIATIONS

The following institutions and their respective curators provided specimens and additional information.

AMNH	Division of Invertebrate Zoology, American Museum of Natural History, New York; Randall T. Schuh
CAFA	California Department of Food and Agriculture, Sacramento; Alan Hardy

CAS	California Academy of Sciences, San Francisco; Paul Arnaud, Jr., Norman Penny
CNC	Canadian National Collection of Insects, Agriculture Canada, Ottawa; Michael D. Schwartz, Robert G. Foottit
CUIC	Cornell University Insect Collection, Ithaca; James K. Liebherr, E. Richard Hoebeke
JTP	John T. Polhemus Collection, Englewood, Colorado
KU	Kansas University, Lawrence; Zachary H. Falin, Alex Slater
MSU	Albert J. Cook Arthropod Research Collection, Michigan State University
ORSU	Oregon State University Arthropod Collection, Corvallis; John D. Lattin; Anthony Cognato
SDNH	San Diego Museum of Natural History; David K. Faulkner
TAMU	Texas A&M University, College Station; Joseph C. Schaffner, Edward C. Riley
UCB	University of California at Berkeley; John Chemsak, Cheryl Barr
UCD	University of California, Davis; the late Robert Schuster
UCR	University of California, Riverside; Saul Frommer, John D. Pinto, Douglas Yanega
UID	University of Idaho, William F. Barr Entomological Museum
UNHP	University of New Hampshire, Durham; Donald Chandler
USNM	United States National Museum of Natural History, Washington, DC; Thomas J. Henry, Michele Touchet
USU	Utah State University, Logan; Wilford J. Hanson
WSU	Washington State University, James Entomological Collection; Richard S. Zack
ZISP	Zoological Institute, Russian Academy of Sciences, St. Petersburg; Fedor Konstantinov

### TRIBE PRNOTOCREPINI KNIGHT

Pronotocrepini Knight, 1929: 217 (new tribe).

**REDIAGNOSIS:** General aspect elongate or slightly ovoid; females sometimes brachypterous and myrmecomorphic; head sometimes oblique; vertex nearly vertical; clypeus visible in dorsal view, usually prominent; second antennal segment inflated at least distally, sometimes strongly so; pronotum with collarlike, flattened, finely upturned anterior margin, flat or swollen calli, shiny or dull surface, and sometimes rugose or with explanate lateral margins; hemelytra either completely fuscous or fuscous with pale or red pattern; vestiture of either pale or dark simple setae; male genitalia with large, strongly sclerotized vesica, and part apical to secondary gonopore bent, tapering to narrow point or blunt knob, without lateral processes; secondary gonopore well developed, usually with denticulate lobes laterally, usually not recognizable as closed ring; female genitalia usually with large sclerotized rings on dorsal labiate plate; posterior wall with bifurcate interramal sclerites, sometimes with medioposterior sclerotized process.

### DISCUSSION

The tribe Hallodapini comprises 50 genera worldwide (Schuh, 1995, 2008). It shows a predominantly Old World distribution with greatest diversity in Africa, tropical Asia, and the Palearctic, with only *Cyrtopeltocoris* Reuter, 1876, and the closely related *Phoradendrepulus* Polhemus and Polhemus, 1985, occurring in the Nearctic. The male genitalic structure, together with the flattened pronotal collar and the hemelytral maculae, are the characters that support

the monophyly of the Hallodapini (Schuh, 1974). Schuh (1974: 294) recognized six groups within the tribe: *Aeolocoris* Reuter, 1903, *Hallodapus* Fieber, 1858, *Systellonotus* Fieber, 1858, *Formicopsella* Poppius, 1914, *Cremnocephalus* Fieber, 1860, and *Coquillettia* Uhler, 1890.

Comparison of *Orectoderus*, *Pronotocrepis*, *Teleorhinus*, *Ethelastia*, and *Coquillettia* with the other genera currently placed within the Hallodapini makes it clear that these five genera do not belong to that group. There are distinct differences in the genitalia (see Kelton, 1959: 67, fig. 93) and in the pretarsus: *Cyrtopeltocoris* and most other Hallodapini have almost straight claws with the basal part widened, a very small pulvillus, and the vesica is long and filamentlike.

Schuh (1974) pointed out that *Orectoderus* and *Teleorhinus* do not belong to the tribe Hallodapini, but rather form a monophyletic group together with *Coquillettia*. McIver and Stonedahl (1987a) noted that the Palearctic genus *Ethelastia* also belonged to this group. McIver and Stonedahl (1987a, 1987b) furthermore considered the Nearctic genus *Pronotocrepis* as belonging to this group.

The Nearctic genus *Pronotocrepis* was described by Knight (1929) and was placed by the author in the contemporaneously erected tribe Pronotocrepini, which Knight (1929) diagnosed on the basis of the "peculiar explanate form of pronotum." Knight (1929) pointed out the similar pretarsal structure of *Orectoderus* and *Pronotocrepis*. In these two genera, as well as in *Ethelastia* and *Teleorhinus*, the claws are straight over most of their length and the large pulvillus is connate over its entire length to the ventral surface of the claw and terminates before the curved apical part of the claw. The close affinity of *Teleorhinus* and *Orectoderus*, according to the form of the pulvilli (arolia of Knight) as well as the antennal structure, was also pointed out by Knight (1922). The vesica is also of similar structure in these four genera, but differs distinctly from that of *Coquillettia* (Kelton, 1959). The secondary gonopore in *Ethelastia* (figs. 1, 2E), *Orectoderus* (fig. 5), *Pronotocrepis* (figs. 8F, 9), and *Teleorhinus* (figs. 9, 10F) is large, well developed, with denticulate lobes laterally, and situated subapically, whereas in *Coquillettia* it is more weakly developed and situated at the apex of the vesica. Compared to *Coquillettia*, the vesica in *Ethelastia* (fig. 1), *Orectoderus* (fig. 5), *Pronotocrepis* (fig. 9), and *Teleorhinus* (fig. 9) is lunate and much broader. Furthermore, *Coquillettia* has a pretarsus with a free pulvillus, attached only basally in contrast to the other four (figs. 2C, 4C, 8C, 10C; Konstantinov, 2008: figs. 9–12). Present examination of *Ethelastia*, *Orectoderus*, *Teleorhinus*, and *Pronotocrepis* and additional studies on *Coquillettia* suggest that only the first four genera form a monophyletic group, to which the name Pronotocrepini can be applied. The distribution of the group is Holarctic, but with greatest genus and species diversity in western North America.

The position of *Coquillettia* within the Phylinae is the subject of another substantial revision (Wyniger, in prep.). The monophyly of the Hallodapini must be the subject of additional investigations.

#### KEY TO GENERA OF PRNOTOCREPINI

1. Lateral margins of pronotum explanate for entire length (fig. 7); second antennal segment strongly inflated (fig. 7); embolium slightly explanate, usually paler than corium; first rostral segment overlapping proximal margin of gula (fig. 8A); females never brachypterous . . . . . *Pronotocrepis* Knight

- Lateral margin of pronotum not explanate; second antennal segment sometimes inflated distally (figs. 3, 7); embolium not explanate; first rostral segment not overlapping proximal margin of gula (figs. 4A, 10A); females submacropterous to strongly brachypterous; Nearctic . . . . . 2
- 2. Head nearly vertical (fig. 1); second antennal segment at most weakly inflated distally (fig. 1); females submacropterous; Palearctic . . . . . *Ethelastia* Reuter
- Head horizontal to oblique; second antennal segment strongly inflated distally; females either macropterous or strongly brachypterous . . . . . 3
- 3. Head oblique (fig. 4A); second antennal segments inflated distally (fig. 3); calli distinct; corium usually not completely black (fig. 3), with dense dull or shiny vestiture; males macropterous (fig. 3); females brachypterous with hemelytra upturned apically (fig. 3); females with second and third abdominal segments strongly petiolate, constricted (fig. 3); Nearctic . . . . . *Orectoderus* Uhler
- Head elongate and horizontal (figs. 7, 10A); second antennal segment inflated distally (fig. 7); corium completely black and very shiny; calli not distinct (fig. 7); vestiture of corium not dense (fig. 10D); males and females macropterous (fig. 7); Nearctic . . . . . *Teleorhinus* Uhler

#### GENUS *ETHELASTIA* REUTER

Type species: *Ethelastia inconspicua* Reuter, 1876b: 34 (by monotypy).

*Ethelastia* Reuter, 1876b: 34 (original description).

**DIAGNOSIS:** Recognized by dorsal coloration (fig. 1), granulate dorsal surface structure, pronotum concave laterally with carinate anterior angles, tibial spines dark, vesica lunate (fig. 1), and long and straight claws with pulvilli attached to claws on its entire length (fig. 2C), shape of metathoracic pleuron (fig. 2B), and the scent-gland auricle with evaporatory area (fig. 2B). Most similar to *Orectoderus* (fig. 3) and *Teleorhinus* (fig. 7) in general body shape, size and coloration (fig. 1), shape of head (fig. 2A), setiferation (fig. 2D), and genitalic structure (figs. 1, 2E, 5, 6, 9, 10F); similar to *Pronotocrepis* in general shape of vesica (figs. 1, 9), first rostral segment overlapping proximal margin of gula (figs. 2A, 8A), and shape of metathoracic pleuron (figs. 2B, 8B) and the scent-gland auricle with evaporatory area (figs. 2B, 8B). Distinguished from *Orectoderus* (fig. 3) by second antennal segment not widened apically, non-myrmecomorphic females, and genitalic structure (fig. 1). From *Teleorhinus* (fig. 7) it can be distinguished by second antennal segment not widened apically and by genitalic structures (fig. 1). The distinction between *Ethelastia* and *Pronotocrepis* is based on general elongate body shape and coloration, the second antennal segment not widened in *Ethelastia*, pronotum without explanate lateral margin, and genitalic structure (fig. 1).

**REDESCRIPTION:** *Male:* Total length 5.70–6.90, length apex clypeus-cuneus fracture 5.01–5.55, width across pronotum 1.61–1.71 (Konstantinov, 2008). **COLORATION:** Dorsal surface ocher; head uniformly black or black with medial yellow line; mandibular plate basally, clypeus almost entirely or basally orangish yellow or mandibular plate and clypeus entirely brownish black; pronotum ocher with two distinct dark calli and pronotal disc with two dark longitudinal

spots laterally or pronotum brownish with anterior orange ocher transverse and medial longitudinal orangish yellow band; mesoscutum and scutellum dark brown or mesoscutum dark brown with scutellum ocher; clavus entirely ocher or ocher with inner half brownish; corium ocher or ocher with distinct longitudinal dark spots; cuneus ocher or orange ocher; membrane fuscous with veins fuscous or yellowish; antenna entirely yellowish or with antennal segments black apically; venter ocher or dark brown; pro-, meso- and metapleuron entirely dark brown or dark brown basally and yellowish apically; scent-gland auricle dark brown or orange apically; femora ocher or slightly orange; tibia ocher; tarsus ocher or brown (fig. 1). SURFACE AND VESTITURE: General aspect slightly shiny; dorsal surface with simple erect setae (fig. 2D); tibia with black spines; claws straight, slightly curved apically; with pulvillus connate to ventral surface of claw over its entire length (fig. 2C). STRUCTURE: Elongate (fig. 1); dorsal surface smooth with pronotum basally, scutellum and corium slightly granulate; pronotum apically with inflated collarlike margin or with flattened margin apically; head obliquely declining (fig. 2A). GENITALIA: Phallosome elongate; vesica simple, lunate, tapering into point or bifurcate apically; secondary gonopore situated apically, with large denticulate lobes laterally (fig. 2E, F); left paramere with anterior process pointed; right paramere straight, pointed apically (fig. 1).

*Female*: Total length 5.00–5.90, length apex clypeus-cuneus fracture 4.50–5.30, width across pronotum 1.40–1.78 (Konstantinov, 2008). COLORATION: Dorsal surface ocher with slightly orange aspect; head uniformly black or orange or black with orange marks; buccula brown; pronotum ocher with two distinct dark calli and pronotal disc with two more or less distinct dark spots or pronotum apically orange, posteriorly with lateral dark spots and medially with roundish yellow spot; mesoscutum and scutellum dark brown or mesoscutum dark brown with scutellum orange; clavus entirely ocher or ocher with inner half brownish; corium ocher or ocher with distinct longitudinal dark spots; cuneus ocher or orange ocher; membrane fuscous with veins fuscous or yellowish; antenna entirely yellowish or with antennal segments black apically; venter ocher or dark brown; pro-, meso- and metapleuron entirely dark brown or dark brown basally and yellowish apically; scent-gland auricle dark brown or orange apically; femora ocher or slightly orange; tibia ocher; tarsus ocher or brown (fig. 1). SURFACE AND VESTITURE: General aspect slightly shiny (fig. 1); dorsal surface with simple erect setae; tibia with black spines; claws straight, slightly curved apically; with pulvillus connate to ventral surface of claw over its entire length. STRUCTURE: Elongate; dorsal surface smooth with pronotum basally, scutellum and corium slightly granulate; pronotum apically with inflated collarlike margin or with flattened margin apically. GENITALIA: Sclerotized rings of dorsal labiate plate large, rounded basally and pointed apically; posterior wall sclerotized (fig. 11).

HOSTS: Caprifoliaceae, Fabaceae, Rosaceae (Konstantinov, 2008).

DISTRIBUTION: Western Palearctic (Konstantinov, 2008)

DISCUSSION: Reuter (1876b) erected the genus *Ethelastia* to accommodate the single species *E. inconspicua*, which was later synonymized by Kiritshenko (1951) with *E. liturata* (Fieber). The first illustrations of male genitalia of *E. liturata* can be found in Kerzhner and Jaczewski (1964: 755; figs. 19–22). In addition to the present study, Konstantinov (2008)—another PBI collaborator—conducted a detailed review of the Palearctic genus *Ethelastia*, describing a

second species within the genus from central and eastern Kazakhstan. Konstantinov (2008) provided a diagnosis of *Ethelastia*, descriptions of the genus and species, new locality and host-plant records, measurements, illustrations of male genitalia, head, pretarsi and tarsi, dorsal habitus photographs of males and females, and a distribution map.

#### KEY TO SPECIES OF *ETHELASTIA*

1. Mesoscutum and scutellum entirely dark brown; pronotum ocher with distinct dark calli; corium ocher with longitudinal dark spots (fig. 1); vesica bifurcate apically (fig. 1) ..... *liturata*
- Mesoscutum dark brown and scutellum ocher; pronotum dark brown laterally, orange anteriorly or anterior medially with round ocher mark posterior medially (fig. 1); vesica pointed apically, with long distinct denticulate anterior lobe (fig. 1). .... *lonicerae*

#### *Ethelastia liturata* (Fieber)

Figures 1, 2, 11

*Phylus lituratus* Fieber, 1858: 339 (new species).

*Ethelastia inconspicua* Reuter, 1876b: 34 (new genus) (syn. by Kritishenko, 1951: 199); Carvalho, 1955a: 49 (key); 1958: 45 (catalog); Kerzhner, 1997: 118 (note); Kerzhner and Josifov, 1999: 342 (catalog); Konstantinov, 2008 (diagnosis, key to species).

*Ethelastia liturata* (Fieber, 1858): Kerzhner and Jaczewski, 1964: 712, 755 (key, genitalic drawings); Kerzhner and Josifov, 1999: 342 (catalog); Konstantinov, 2008 (diagnosis, description).

**DIAGNOSIS:** Similar to *lonicerae* in general aspect, coloration, and size (fig. 1). Differs from *lonicerae* in mesoscutum and scutellum entirely dark brown, pronotum with distinct dark calli, corium with longitudinal dark spots, and vesica bifurcate apically.

**REDESCRIPTION:** *Male:* 6.0–6.9, length apex clypeus-cuneus fracture 5.15–5.95, width across pronotum 1.58–1.68 (Konstantinov, 2008). **COLORATION:** Dorsal surface ocher; head uniformly black; mandibular plate and clypeus entirely brownish black; or pronotum brownish with anterior orange ocher transverse and medial longitudinal orangish yellow band; mesoscutum and scutellum dark brown; clavus ocher with inner half brownish; corium ocher with distinct longitudinal dark spots; cuneus orange ocher; membrane fuscous with veins fuscous; antennal segments ocher, black apically; dark brown; pro-, meso- and metapleuron entirely dark brown or dark brown basally and yellowish apically; scent-gland auricle dark brown or orange apically; femora ocher or slightly orange; tibia ocher; tarsus brown (fig. 1). **SURFACE AND VESTITURE:** General aspect slightly shiny; dorsal surface with simple erect setae (fig. 2D); tibia with black spines; claws straight, slightly curved apically (fig. 2C); with pulvillus connate to ventral surface of claw over its entire length (fig. 2C). **STRUCTURE:** Elongate; dorsal surface smooth with pronotum basally, scutellum and corium slightly granulate; pronotum apically with flattened margin apically. **GENITALIA:** Phallosome elongate; vesica simple, lunate,

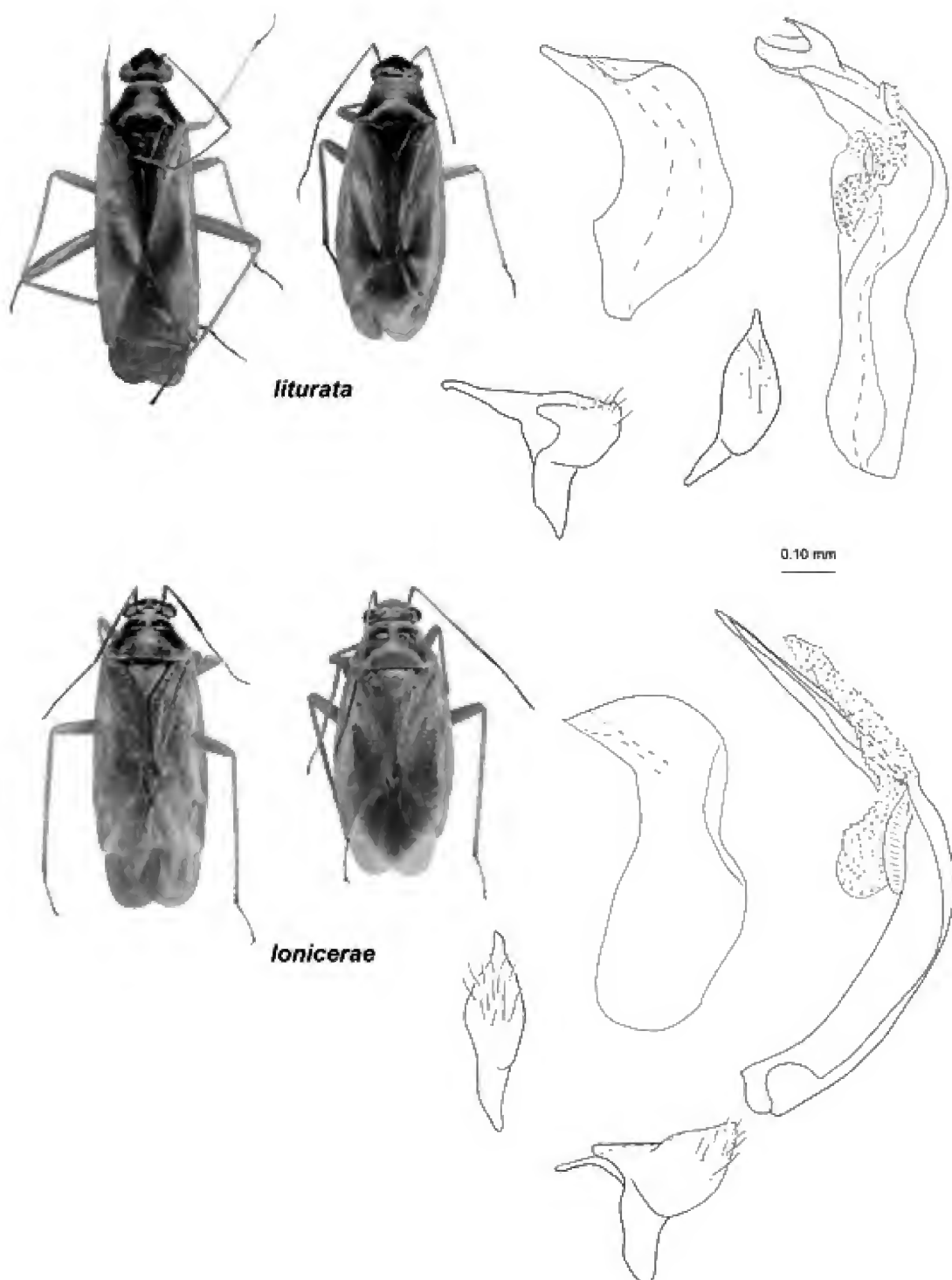


FIGURE 1. Habitus view and male genitalia of *Ethelastia* spp.; males (left) and females (right) in dorsal view. Male genitalia of *Ethelastia* spp.; vesica (lateral view), phallosome (lateral view), left paramere (lateral view), right paramere. Habitus pictures according to Konstantinov (2008).

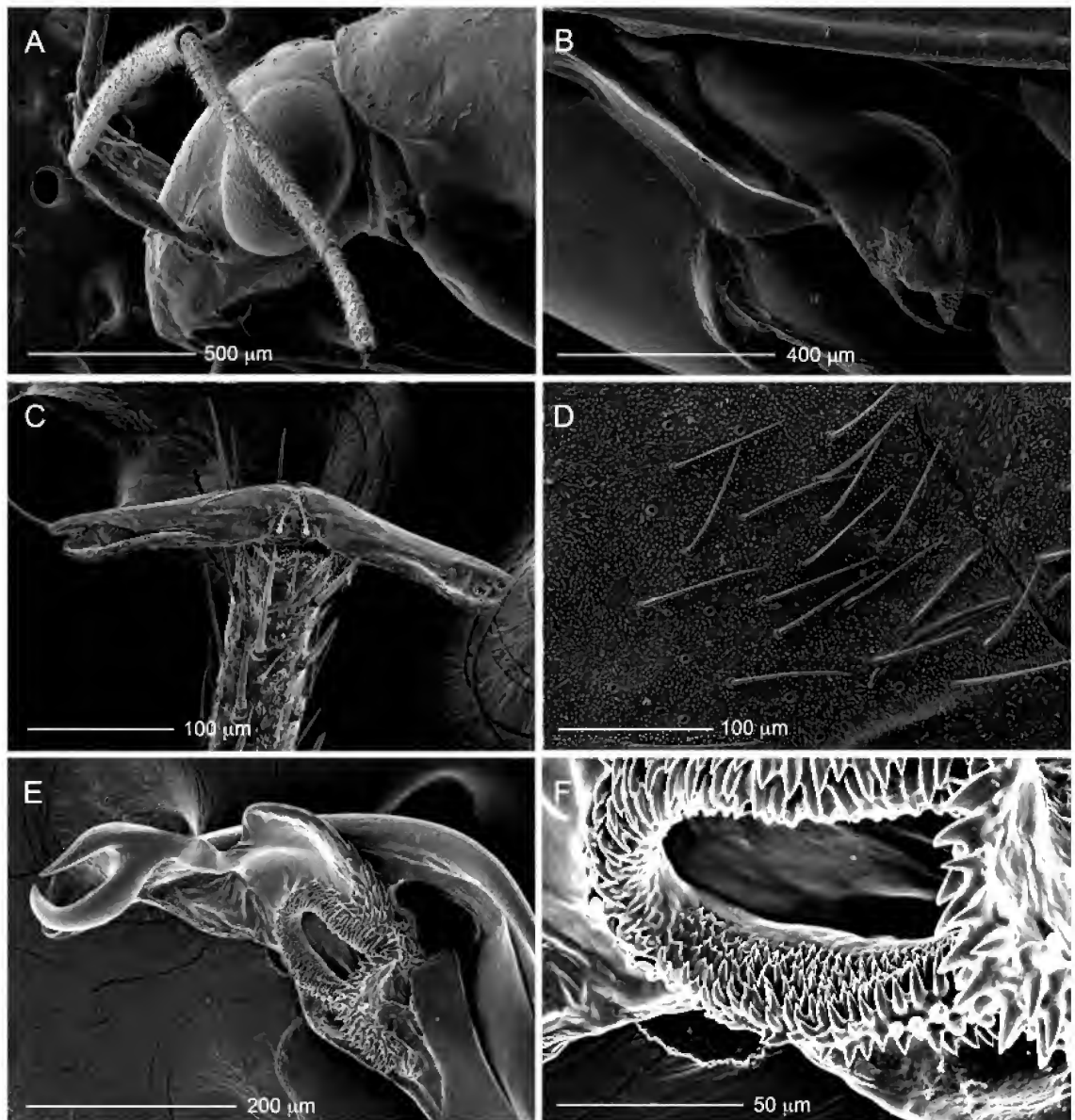


FIGURE 2. Scanning electron micrographs of *Ethelastia liturata* (male). A. Head and thorax (lateral view). B. Metathoracic scent-gland evaporatory area (lateral view). C. Pretarsus (frontal view). D. Setae on hemelytra, detail of microstructure. E. Vesica with secondary gonopore (dorsolateral view). F. Detail of secondary gonopore.

bifurcate apically (fig. 1); secondary gonopore situated apically (fig. 2E), with large denticulate lobes laterally (fig. 2F); left paramere with anterior process pointed; right paramere straight, pointed apically (fig. 1).

*Female*: Total length 5.20–5.90, length apex clypeus-cuneus fracture 4.60–5.30, width across pronotum 1.40–1.75 (Konstantinov, 2008). COLORATION: Dorsal surface ocher with slightly orange aspect; head uniformly black or black with orange marks; buccula orange; pronotum apically orange, posteriorly with lateral dark spots and medially with roundish yellow spot; mesoscutum and scutellum dark brown; clavus ocher with inner half brownish; corium ocher with distinct longitudinal dark spots; cuneus orange ocher; membrane fuscous with veins yellowish; antenna entirely yellowish or with antennal segments black apically; venter ocher or dark brown; pro-, meso- and metapleuron entirely dark brown or dark brown basally and yellowish apically; scent-gland auricle dark brown or orange apically; femora slightly orange; tibia ocher; tarsus brown (fig. 1). SURFACE AND VESTITURE: General aspect slightly shiny; dorsal surface with simple erect setae; tibia with black spines; claws straight, slightly curved apically; with pulvillus connate to ventral surface of claw over its entire length. STRUCTURE: Elongate oval (fig. 1); dorsal surface smooth with pronotum basally, scutellum and corium slightly granulate; pronotum with flattened margin apically. GENITALIA: Sclerotized rings of dorsal labiate plate elongate and large, rounded basally and pointed apically (fig. 11).

HOSTS: Rosaceae, Fabaceae (Konstantinov, 2008).

DISTRIBUTION: Western Palearctic, Moldova, South Ukraine, southern territories of European Russia, Kazakhstan (Konstantinov, 2008).

DISCUSSION: The review of Konstantinov (2008) resulted in the description of this new species within the monotypic (to date) genus *Ethelastia*. Konstantinov (2008) provided a detailed diagnosis of male and female, but without female genitalic characters. The female genitalia of *E. liturata* are documented in the present work.

SPECIMENS EXAMINED: **KAZAKHSTAN: East Kazakhstan Prov.**: Arten-tau Mts W Kokpekty, Zaysan, 48.75°N 82.36666°E, 08 Jun 1930, A.K. Lukyanovich, 1 ♀ (00144608) (ZISP); 11 Jun 1930, A.K. Lukyanovich, 2 ♂ (00175549, 00175550) (AMNH); 14 Jun 1930, A.K. Lukyanovich, 1 ♀ (00144600) (ZISP). **Karaganda Prov.**: 30 km NW of Dzhezkazgan, 47.9°N 68.05°E, 541 m, 04 Jun 1962, I.M. Kerzhner, *Spiraea hypericifolia* (Rosaceae), 1 ♂ (00155870), 1 ♀ (00156051–00156052) (ZISP). 40 km S of Atasu [Zhana-Arka], 48.31666°N 71.66666°E, 24 Jun 1960, I.M. Kerzhner, *Spiraea hypericifolia* (Rosaceae), 2 ♀ (00175551, 00175552) (AMNH). **UKRAINE**: Krasnograd [former Konstantinograd], 49.36666°N 35.45°E, 25 May 1926, A.K. Lukyanovich, 1 ♂ (00144641) (ZISP). Provalye, 48.16666°N 39.83333°E, 13 Jun 1929, Talitskiy, 1 ♀ (00144669, 00144670) (ZISP).

*Ethelastia loniceræ* Konstantinov

Figures 1, 2, 11

*Ethelastia loniceræ* Konstantinov, 2008: 219 (new species).

TYPE MATERIAL (EXAMINED): *Ethelastia loniceræ*: PARATYPES: **KAZAKHSTAN: Akmola Prov.**: Atbasar, 51.8°N 68.35°E, 18 Jun 1937, Rezvoy, 1 ♂ (00144484–00144485, 00144487), 1 ♀

(00144493). **Karaganda Prov.:** 40 km S of Atasu [Zhana-Arka], 48.31666°N 71.66666°E, 20 Jun 1960, I.M. Kerzhner, *Lonicera xylosteum* (Caprifoliaceae), 1 ♂ (00144482), 21 Jun 1960, I.M. Kerzhner, *Lonicera xylosteum* (Caprifoliaceae), 2 ♀ (00144465, 00144470), 1 ♂ (00143962).

**DIAGNOSIS:** Most similar to *liturata* in general aspect, coloration, and size (fig. 1). Can easily be distinguished by pronotum mostly dark with orange spot anteriorly, mesoscutum dark and scutellum entirely ocher and vesica with long distinct denticulate anterior lobe (fig. 1).

**REDESCRIPTION:** *Male:* 5.70–6.20, length apex clypeus-cuneus fracture 4.85–5.35, width across pronotum 1.65–1.78 (Konstantinov, 2008). **COLORATION:** Dorsal surface ocher; head black with medial yellow line; mandibular plate basally, clypeus almost entirely or basally orangish yellow; pronotum ocher with two distinct dark calli and pronotal disc with two dark longitudinal spots laterally; mesoscutum dark brown with scutellum ocher; clavus entirely ocher; corium ocher; cuneus ocher; membrane fuscous with veins fuscous; antenna entirely yellowish; venter ocher; pro-, meso- and metapleuron entirely dark brown or dark brown basally and yellowish apically; scent-gland auricle dark brown or orange apically; femora ocher; tibia ocher; tarsus ocher (fig. 1). **SURFACE AND VESTITURE:** General aspect slightly shiny; dorsal surface with simple erect setae (fig. 2D); tibia with black spines; claws straight, slightly curved apically; with pulvillus connate to ventral surface of claw over its entire length. **STRUCTURE:** Elongate; dorsal surface smooth with pronotum basally, scutellum and corium slightly granulate; pronotum apically with inflated collarlike margin. **GENITALIA:** Phallosome elongate; vesica simple, lunate shaped, tapering into point; secondary gonopore situated apically, with large denticulate lobes laterally; left paramere with anterior process pointed; right paramere straight, pointed apically (fig. 1).

*Female:* Total length 5.00–5.50, length apex clypeus-cuneus fracture 4.50–4.95, width across pronotum 1.58–1.78 (Konstantinov, 2008). **COLORATION:** Dorsal surface ocher with slightly orange aspect; orange with dark spots close to posterior margin of eyes; buccula brown; pronotum ocher with two distinct dark calli and pronotal disc with two more or less distinct dark spots; mesoscutum dark brown with scutellum orange; clavus entirely ocher; corium ocher; cuneus ocher; membrane fuscous with veins fuscous; antenna entirely yellowish or with antennal segments black apically; venter ocher or dark brown; pro-, meso- and metapleuron entirely dark brown or dark brown basally and yellowish apically; scent-gland auricle dark brown or orange apically; femora ocher; tibia ocher; tarsus ocher (fig. 1). **SURFACE AND VESTITURE:** General aspect slightly shiny (fig. 1); dorsal surface with simple erect setae; tibia with black spines; claws straight, slightly curved apically; with pulvillus connate to ventral surface of claw over its entire length. **STRUCTURE:** Elongate oval; dorsal surface smooth with pronotum basally, scutellum and corium slightly granulate; pronotum apically with inflated collarlike margin. **GENITALIA:** Sclerotized rings of dorsal labiate plate wide and large, flat, rounded basally and pointed apically (fig. 11).

**HOST:** Caprifoliaceae (Konstantinov, 2008).

**DISTRIBUTION:** Central and eastern Kazakhstan (Konstantinov, 2008).

**DISCUSSION:** The review of Konstantinov (2008) resulted in the description of this new species. The female genitalia of *E. loniceræ* are documented in the present work.

GENUS *ORECTODERUS* UHLER

Type species: *Orectoderus obliquus* Uhler, 1876 (by monotypy).

*Orectoderus* Uhler, 1876: 319 (original description); Scudder, 1882: 222 (index); Atkinson, 1890: 175 (catalog); Smith, 1890: 428 (catalog); Reuter, 1910: 151 (catalog); Schouteden, 1913: 156 (reference); Van Duzee, 1916a: 210 (key), 1917: 368 (catalog); Knight, 1922: 67 (note), 1923: 474 (key), 1941: 22 (key), 1968a (diagnosis, key to males), 1968b: 23 (key); Blatchely, 1926: 915 (key), 916 (description); Carvalho, 1952: 70 (catalog), 1955a: 61 (key); Kelton, 1959: 47 (diagnosis); Bliven, 1962: 52–53 (description, discussion), 58 (note); Schuh, 1974: 298 (note, description, discussion), 299 (description, discussion), 302 (note); Kelton, 1980: 282 (diagnosis, key); McIver and Stone-dahl, 1987a, 1987b (description, discussion, biology); Polhemus and Polhemus, 1988: 25 (note). *Orectoderes* [sic] Reuter, 1909: 65 (description, comments).

DIAGNOSIS: Sexually dimorphic (fig. 3); dorsal surface fuscous, sometimes with pale or pale reddish pattern; vertex flat, rugose; second antennal segment usually inflated distally (fig. 3); pronotum with strong, erect, pale or black or reclining golden, shiny setae (fig. 4D); pronotum trapezoidal or longer than wide; with distinguishable calli; males macropterous; females brachypterous with apex of hemelytra tapering to point, curving in vertical direction; myrmecomorphic (fig. 3); vesica simple, strongly sclerotized, widest at level of secondary gonopore (fig. 5); secondary gonopore not readily identifiable as closed sclerotized ring, but rather as elongate structure, sometimes with large lobes laterally bearing distinct denticles; dorsal labiate plate of female genitalia with large rings (fig. 11); posterior wall bifurcate sclerotized interrampally (fig. 11). Distinguished from *Pronotocrepis* by lateral margin of pronotum and embolium not explanate (fig. 3), second antennal segment just inflated distally (fig. 3), first rostral segment not overlapping proximal margin of gula (fig. 4A). Distinguished from *Teleorhinus* by vesica (figs. 5, 9), shape of head (figs. 4A, 10A), shape of pronotum (figs. 3, 7), shape of metathoracic pleuron (fig. 10B) and the scent-gland auricle with evaporatory area (figs. 4B, 10B) and by females always brachypterous (fig. 3).

REDESCRIPTION: *Male*: Total length 5.45–8.45, length apex clypeus-cuneus fracture 3.82–5.96, width across pronotum 1.23–1.76. COLORATION: Head black; labium black with first segment reddish black; pronotum black; mesoscutum and scutellum black or dark brown; clavus brown with pale or red band along claval suture; corium brown with either white or reddish white band parallel to claval suture reaching apex of clavus or with pale band extending around inner apical angle of corium reaching to base of cuneus; cuneus either completely brown or brown with basal half pale; membrane including veins fuscous; antennal segments 1 to 4 reddish brown or brown with second segment sometimes lighter proximally; venter dark brown; pro-, meso- and metapleuron black; coxae completely brown or orange with brown base; trochanter brown or reddish brown; femora orange, sometimes bright reddish orange; tibia yellowish brown, dark brown apically; tarsus brown, sometimes second tarsal segment brighter than first and third. SURFACE AND VESTITURE: General aspect shiny or rather dull; pronotum and scutellum shiny or rugose with sometimes greyish appearance; pronotum either clothed with strong, erect, pale setae or strong, erect black setae, both types longer than diameter of first antennal segment or with fine golden, shiny reclining setae shorter than diameter

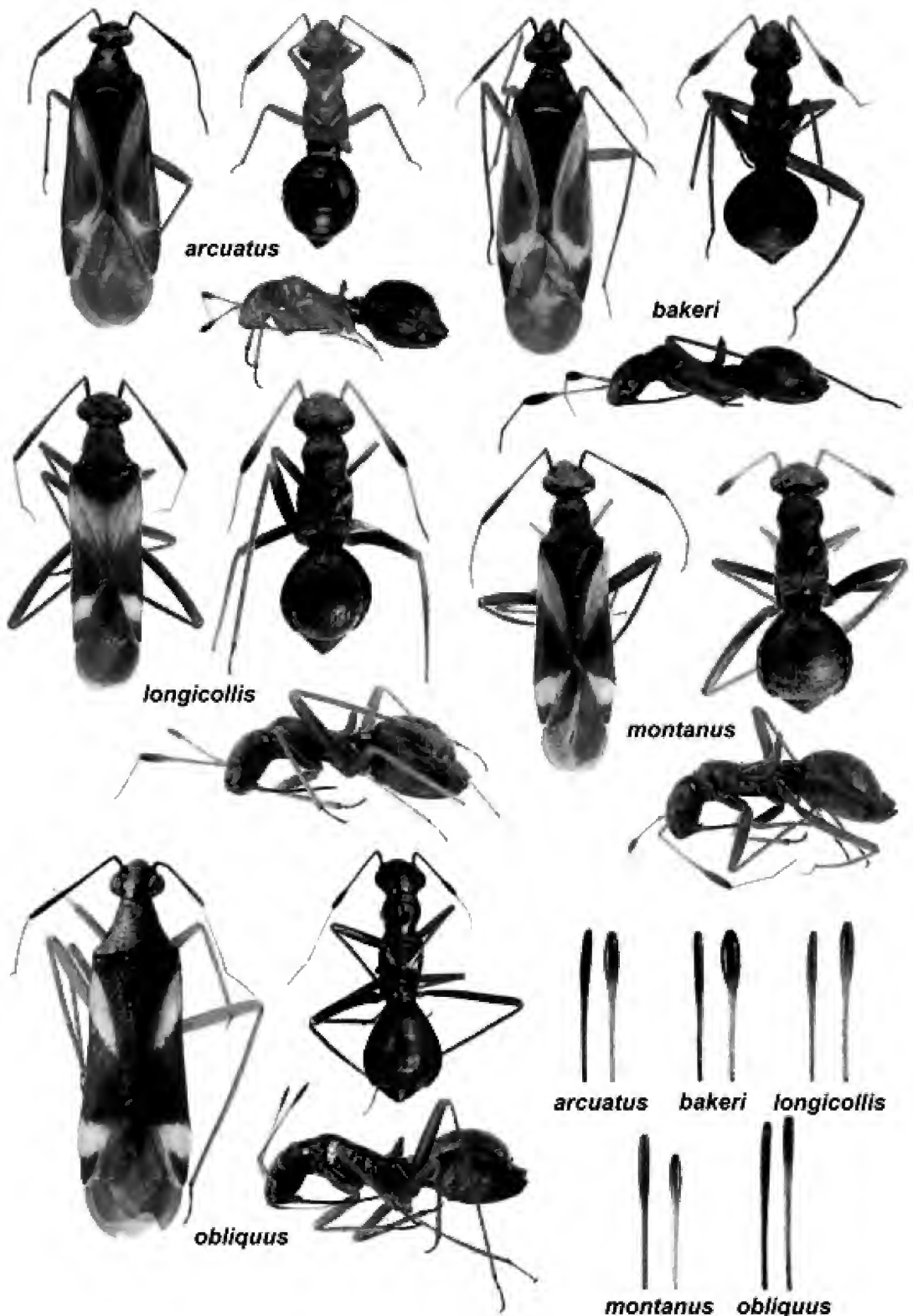


FIGURE 3. Habitus view and antennal segments of *Orectoderus* spp.; males (left) in dorsal view and females (right and below) in dorsal and lateral view; antennal segments of males (left) and females (right).

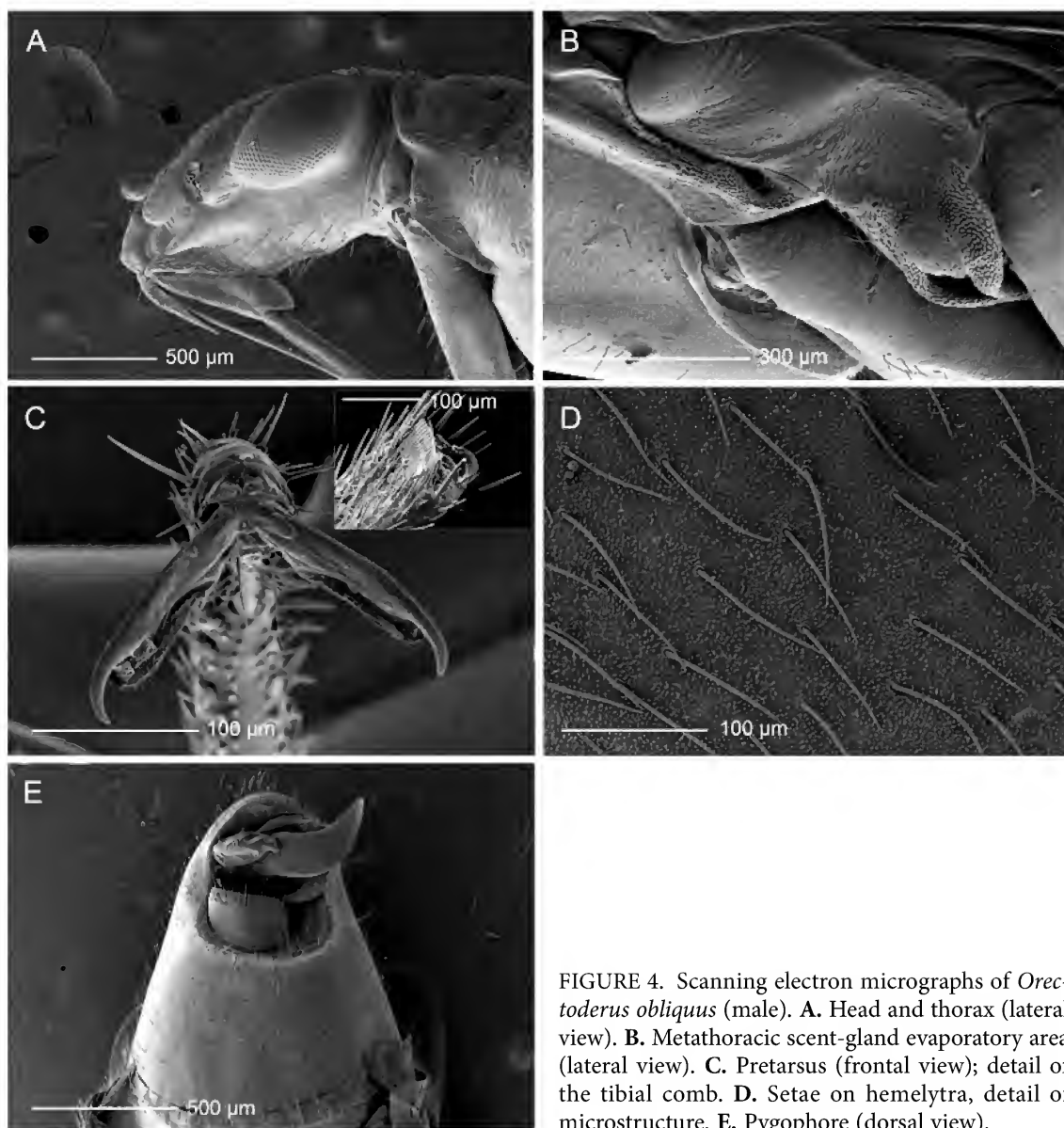


FIGURE 4. Scanning electron micrographs of *Orectoderus obliquus* (male). **A.** Head and thorax (lateral view). **B.** Metathoracic scent-gland evaporatory area (lateral view). **C.** Pretarsus (frontal view); detail of the tibial comb. **D.** Setae on hemelytra, detail of microstructure. **E.** Pygophore (dorsal view).

of first antennal segment; tibia with black spines; claws straight for most of length, curved apically; large pulvillus connate to ventral surface of claw over its entire length, terminating before curved apical part of claw (fig. 4C); pygophore densely covered by erect setae (fig. 4E). **STRUCTURE:** Elongate (fig. 3); head obliquely declining (fig. 4A); labium reaching to meso- or metacoxa; vertex flat and rugose; second antennal segment either slightly or distinctly widened distally; pronotum apically with collarlike, flattened margin. **GENITALIA:** Phallosome elongate, curved, pointed apically (fig. 5); vesica simple, strongly sclerotized, apical part beyond

secondary gonopore bent, tapering into point (fig. 5); anterior process of left paramere either pointed or round apically, sometimes bearing distinct long setae on inner surface (fig. 6); right paramere straight, pointed apically (fig. 5).

*Female*: Myrmecomorphic, brachypterous; total length 4.62–6.18, width across pronotum 0.86–1.06. COLORATION: Head, pronotum, mesoscutum, scutellum, and hemelytra brown-orange or black; corium sometimes with faintly paler band along claval suture; first tergite sometimes pale distally; second tergite sometimes distinctly white proximally; all other tergites black; first antennal segment yellowish orange; second antennal segment yellowish orange proximally, dark brown distally; third and fourth antennal segments yellowish orange or brown; venter black; pro-, meso- and metapleuron brown-orange; coxae, trochanter, femora, and tibia brown-orange; tarsus brown. SURFACE AND VESTITURE: General aspect either shiny or dull; head and pronotum smooth and very shiny or more rugose; pronotum clothed with strong, erect, pale or black setae or with fine, reclining golden shining setae; abdomen clothed with golden shining pale setae. STRUCTURE: Head oblique (fig. 3); second antennal segment usually inflated distally (fig. 3); pronotum with distinctly inflated calli; proximal pronotal edge concave medially; brachypterous, hemelytra pointed, strongly upturned reaching to first abdominal segment (fig. 3); second and third abdominal segments strongly petiolate constricted; connexiva upturned. GENITALIA: Dorsal labiate plate sclerotized laterally (fig. 11); sclerotized rings of dorsal labiate plate large, usually rounded basally and pointed apically; common oviduct sometimes with sclerotized spots laterally; posterior wall with bifurcate interramal sclerites (fig. 11).

HOSTS: Asteraceae, Caprifoliaceae, and Rosaceae. Species of *Orectoderus* are usually associated with grasses or herbaceous plants. Further, a typical feature for *Orectoderus* species is their occurrence on the ground in association with ants (Knight, 1941; McIver and Stonedahl, 1987b).

DISTRIBUTION: United States, Canada.

DISCUSSION: Uhler (1876) erected the genus *Orectoderus* to accommodate the single species, *O. obliquus*. He mentioned that both sexes have fully developed hemelytra and hind wings, however my study shows that females of *Orectoderus* are always brachypterous. The taxonomy of *Orectoderus* has been mainly based on coloration; only Kelton (1980) included the vestiture of the hemelytra in his key to species. Genitalic investigations were conducted on only one species prior to the present study, *O. obliquus* (Kelton, 1959). Genitalic characters for all *Orectoderus* species, males as well as females, are discussed herein for the first time.

The features of greatest utility for species discrimination within *Orectoderus* are the vesica, sclerotized rings, posterior wall, and pronotal vestiture; all exceed the hemelytral vestiture as the most reliable characters. There are three types of pronotal setae: strong, erect setae that are either pale or black and fine, reclining golden, shiny setae. The characteristics of the pronotal calli, sometimes used for species recognition (Knight, 1927; Kelton, 1980), seem to be variable.

Knowledge of the biology of *Orectoderus* is limited to a detailed study of *O. obliquus* (McIver and Stonedahl 1987b) from central Oregon.

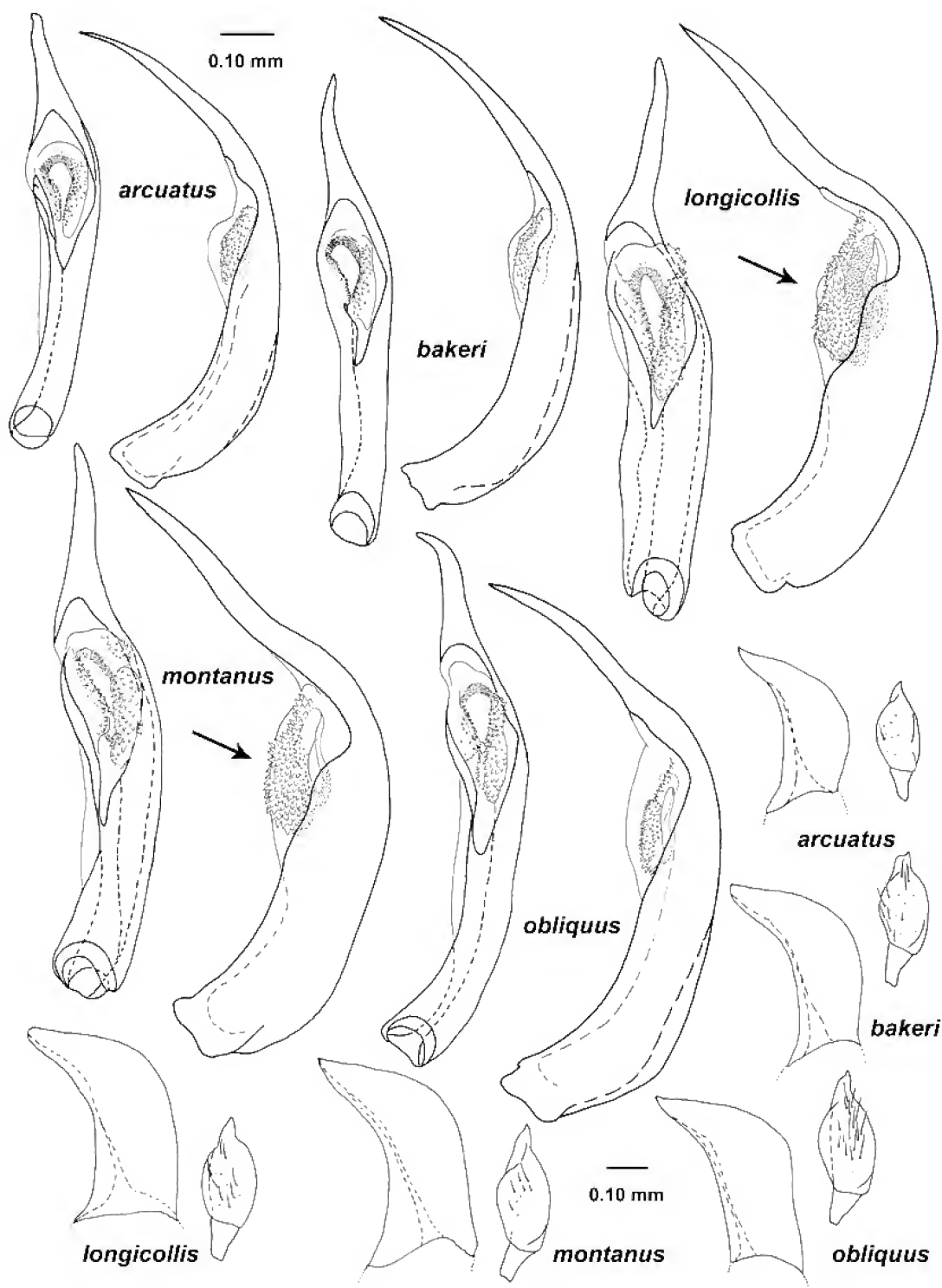


FIGURE 5. Male genitalia of *Orectoderus* spp.; vesica (dorsolateral and lateral view), phallotheca (lateral view), right paramere.

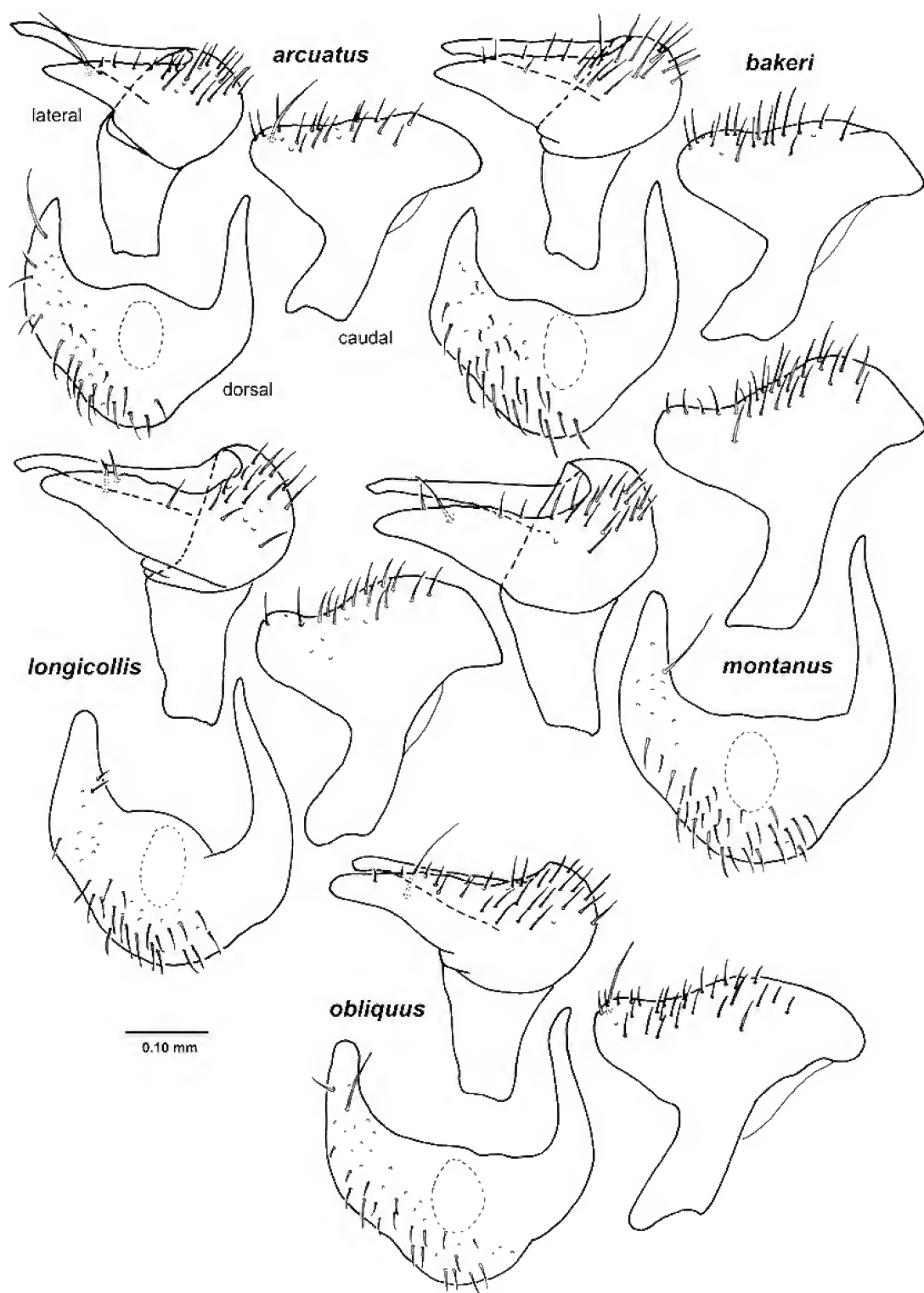


FIGURE 6. Male genitalia of *Orectoderus* spp.; left paramere (lateral, caudal and dorsal view).

KEY TO SPECIES OF *ORECTODERUS* UHLER

## Males

1. Pronotum with strong, erect, black setae longer than diameter of first antennal segment . . . . . *arcuatus* Knight
- Pronotum with strong, erect, pale setae longer than diameter of first antennal segment or fine, pale, golden, shiny reclining setae shorter than diameter of first antennal segment . . . . . 2
2. Clavus pale, brown only on proximal  $\frac{1}{3}$  and with a very narrow brownish band along claval commissure (fig. 3); pronotum campanulate . . . . . *longicollis* Uhler
- Clavus brown with pale band along claval suture; pronotum more trapezoidal, dull or shining . . . . . 3
3. Pronotum dull, with strong, erect, pale setae longer than diameter of first antennal segment . . . . . *bakeri* Knight
- Pronotum dull or shining, with fine, reclining pale, golden, shiny setae shorter than diameter of first antennal segment . . . . . 4
4. Pronotum very shiny; total body length 6.96–8.45 . . . . . *obliquus* Uhler
- Pronotum dull, with greyish appearance; total body length 5.45–6.71 . . . *montanus* Knight

## Females

1. Second antennal segment strongly inflated proximally (fig. 3); pronotal vestiture with strong, erect, pale setae; pronotum dull, black or orange; calli strongly swollen (fig. 3); second tergite with whitish callus proximally. . . . . *bakeri* Knight
- Second antennal segment gradually inflated proximally or almost straight; pronotal vestiture without strong, erect, pale setae; pronotum dull or shiny, black or orange; calli swollen or almost flat; second tergite with whitish callus proximally or just with narrow whitish proximal margin . . . . . 2
2. Pronotum bright orange or brownish bearing strong, erect, dark setae; calli distinctly swollen (fig. 3); second tergite with whitish callus proximally . . . *arcuatus* Knight
- Pronotum black without strong, erect, dark setae; calli almost flat; second tergite just with narrow whitish proximal margin . . . . . 3
3. Just the very proximal part of second antennal segment slightly inflated (fig. 3); pronotum almost flat (fig. 3) . . . . . *obliquus* Uhler
- Second antennal segment inflated gradually. . . . . 4
4. Pronotal vestiture with pale, pubescent setae; pronotum with greyish appearance; calli of pronotum slightly swollen; head, pronotum, scutellum, and hemelytra dark brown (fig. 3). . . . . *longicollis* Uhler
- Pronotal vestiture with reclining more brownish setae; pronotum slightly shiny; calli of pronotum almost flat; head, pronotum, scutellum, and hemelytra dark reddish orange . . . . . *montanus* Knight

*Orectoderus arcuatus* Knight

Figures 3, 5, 6, 11; map 1; tables 1, 2

*Orectoderus arcuatus* Knight, 1927: 302 (new species); Carvalho, 1958: 175 (catalog); Knight, 1968a: 314 (discussion); Knight, 1968b: 64 (diagnosis, distribution).

*Orectoderus schuhi* Knight, 1964: 149 (new species, description); 1968a: 314 (note); 1968b: 64 (diagnosis, distribution). NEW SYNONYMY.

TYPE MATERIAL (EXAMINED): *Orectoderus arcuatus*: HOLOTYPE: Male: [USA: Washington: Adams Co.] Ritzville [47.1275°N 118.37889°W] 17 May 1921 [1923 in original description], M.C. Lane (AMNH\_PBI 00069007) (USNM). ALLOTYPE: 16 May 1923, M.C. Lane, 1 ♀ (00069141) (USNM). PARATYPES: [USA: Washington: Adams Co.] Ritzville, 47.1275°N 118.37889°W, 12 May 1923, M.C. Lane, 1 ♂ (00096194), 1 ♀ (00096195) (AMNH). 1 ♂ (00068996) (USNM); 1 May 1923, M.C. Lane, 1 ♀ [maybe not recognized by Knight as female but as nymph (see Knight, 1927: 303)] (00069142) (USNM).

*Orectoderus schuhi*: HOLOTYPE: Male: [USA: Oregon: Klamath Co.] 20 mi N Beatty, Sycan River [42.69586°N 121.27234°W] 30 May 1959, Joe Schuh (AMNH\_PBI 00069009) (USNM).

DIAGNOSIS: Coloration of hemelytra in males variable, either with corium brown with either pale, reddish white or pale band parallel to claval suture reaching apex of clavus or with pale band extending around inner apical angle of corium reaching to pale basal part of cuneus or pale or reddish pattern along claval suture, a condition shared with *O. bakeri*; males as well as females with pronotum bearing strong, erect, black setae longer than diameter of first antennal segment on pronotum in male as well as in female; pronotum shiny; anterior process of left paramere pointed apically, bearing distinct long setae (fig. 6); female always with bright brown-orange head and pronotum (fig. 3); common oviduct of female genitalia with sclerotized spots laterally (fig. 11). Most similar to *O. bakeri* in general aspect and vesica, but distinguished by shiny pronotum bearing strong, black setae.

REDESCRIPTION: *Male*: Total length 6.40–7.31, length apex clypeus-cuneus fracture 4.50–5.10, width across pronotum 1.44–1.61. COLORATION: Corium either brown with pale or reddish white band parallel to claval suture reaching apex of clavus or with pale band extending around inner apical angle of corium reaching to pale basal part of cuneus (fig. 3). SURFACE AND VESTITURE: General aspect shiny; pronotum and scutellum rugose; pronotum just faintly shiny; dorsal surface clothed with dark setae; pronotum with strong, erect, black setae longer than diameter of first antennal segment. STRUCTURE: Labium reaching to metacoxa. GENITALIA: Anterior process of left paramere bearing distinct long seta on inner surface (fig. 6).

*Female*: Total length 4.66–5.59, width across pronotum 0.92–1.08. COLORATION: Head, pronotum, mesoscutum, scutellum, and hemelytra bright brown-orange (fig. 3). SURFACE AND VESTITURE: General aspect shiny; pronotum bearing strong, erect, black setae longer than diameter of first antennal segment; scutellum and hemelytra clothed with reclining dark, very fine setae. STRUCTURE: Second antennal segment strongly inflated distally (fig. 3). GENITALIA: Sclerotized rings of dorsal labiate plate rounded basally, pointed apically; common oviduct with sclerotized spots laterally (fig. 11); posterior wall with bifurcate interramal sclerites, pointed medially (fig. 11).

TABLE 1. Measurements of *Orectoderus* species, males

	Length						Width			InterOc	AntSeg2
	Body	CunClyp	Head	Pron	Scut	Cun	Head	Pron	Scut		
<i>O. arcuatus</i> ♂ (N = 5)											
Mean	6.91	4.88	0.79	0.86	0.66	0.94	1.05	1.52	1.08	0.45	1.96
SD	0.39	0.26	0.11	0.06	0.03	0.12	0.03	0.07	0.13	0.05	0.10
Range	0.91	0.59	0.26	0.16	0.07	0.30	0.08	0.17	0.35	0.14	0.26
Min	6.40	4.50	0.61	0.76	0.62	0.77	1.00	1.44	0.90	0.37	1.80
Max	7.31	5.10	0.88	0.92	0.69	1.07	1.08	1.61	1.25	0.51	2.06
<i>O. bakeri</i> ♂ (N = 5)											
Mean	6.96	5.02	0.85	0.88	0.68	0.97	1.08	1.50	1.01	0.49	2.08
SD	0.46	0.23	0.16	0.11	0.06	0.08	0.04	0.12	0.11	0.03	0.14
Range	1.16	0.58	0.33	0.29	0.14	0.16	0.11	0.28	0.31	0.09	0.36
Min	6.61	4.84	0.67	0.78	0.62	0.89	1.04	1.36	0.85	0.45	1.92
Max	7.77	5.42	1.01	1.07	0.76	1.05	1.15	1.64	1.16	0.54	2.28
<i>O. longicollis</i> ♂ (N = 5)											
Mean	6.26	4.64	0.88	0.99	0.55	0.69	1.11	1.33	1.01	0.52	2.17
SD	0.28	0.18	0.09	0.05	0.02	0.04	0.05	0.06	0.09	0.04	0.14
Range	0.65	0.43	0.24	0.13	0.05	0.08	0.15	0.15	0.24	0.12	0.34
Min	6.00	4.46	0.79	0.94	0.53	0.65	1.03	1.28	0.89	0.45	2.03
Max	6.66	4.89	1.03	1.08	0.58	0.73	1.17	1.44	1.13	0.58	2.37
<i>O. montanus</i> ♂ (N = 5)											
Mean	6.30	4.59	0.73	0.94	0.62	0.79	1.14	1.41	1.01	0.50	1.99
SD	0.50	0.45	0.13	0.06	0.06	0.06	0.08	0.11	0.12	0.05	0.19
Range	1.27	1.17	0.33	0.17	0.14	0.14	0.22	0.25	0.29	0.12	0.50
Min	5.45	3.82	0.52	0.84	0.52	0.72	1.02	1.23	0.83	0.45	1.70
Max	6.71	5.00	0.85	1.00	0.66	0.85	1.24	1.48	1.12	0.57	2.20
<i>O. obliquus</i> ♂ (N = 5)											
Mean	7.77	5.61	0.91	1.12	0.74	1.07	1.18	1.71	1.15	0.54	2.28
SD	0.56	0.34	0.21	0.08	0.04	0.05	0.06	0.06	0.06	0.04	0.16
Range	1.49	0.87	0.55	0.18	0.10	0.12	0.14	0.14	0.16	0.11	0.44
Min	6.96	5.09	0.60	1.02	0.69	1.00	1.11	1.62	1.06	0.49	2.01
Max	8.45	5.96	1.15	1.19	0.78	1.11	1.25	1.76	1.22	0.60	2.45

HOSTS: *Artemisia tridentata*, *A. tripartita*, *Chrysanthemum nauseosus* (Asteraceae), *Symphoricarpos* sp. (Caprifoliaceae), *Polygonum* sp. (Polygonaceae), *Purshia tridentata*, and *Rubus* sp. (Rosaceae).

DISTRIBUTION: Canada: British Columbia, Manitoba. United States: West Coast, Idaho, Utah, Colorado, and Wyoming (map 1).

DISCUSSION: Knight (1964) pointed out that *Orectoderus schuhi* is allied to *O. arcuatus*, and differs only by the red color of a band along the claval suture and the shorter second antennal segment. Knight (1964) mentioned the fuscous pubescence of *O. schuhi*. Within the genus *Orectoderus* the only species with fuscous vestiture is *O. arcuatus*. Base on the examination of the holotype and all red specimens on hand, I have concluded that *O. schuhi* is synonymous with *O. arcuatus*, new synonymy.

TABLE 2. Measurements of *Orectoderus* species, females

	Length				Width			InterOc	AntSeg2
	Body	Head	Pron	Scut	Head	Pron	Scut		
<i>O. arcuatus</i> ♀ (N = 5)									
Mean	5.24	0.85	0.96	0.19	1.24	0.99	0.63	0.64	1.93
SD	0.37	0.16	0.03	0.03	0.02	0.06	0.08	0.02	0.07
Range	0.94	0.43	0.09	0.07	0.07	0.15	0.23	0.05	0.20
Min	4.66	0.60	0.91	0.17	1.20	0.92	0.50	0.62	1.86
Max	5.59	1.03	1.00	0.25	1.27	1.08	0.73	0.67	2.05
<i>O. bakeri</i> ♀ (N = 5)									
Mean	5.33	0.86	1.00	0.19	1.27	1.00	0.65	0.67	1.98
SD	0.18	0.10	0.02	0.02	0.04	0.06	0.05	0.04	0.06
Range	0.51	0.25	0.05	0.05	0.10	0.15	0.12	0.09	0.13
Min	5.12	0.78	0.97	0.17	1.21	0.94	0.59	0.62	1.91
Max	5.62	1.03	1.01	0.21	1.31	1.10	0.71	0.71	2.04
<i>O. longicollis</i> ♀ (N = 5)									
Mean	5.22	0.77	1.05	0.20	1.22	1.00	0.77	0.62	2.15
SD	0.09	0.09	0.05	0.06	0.03	0.07	0.03	0.04	0.06
Range	0.24	0.21	0.14	0.15	0.07	0.18	0.08	0.11	0.14
Min	5.11	0.64	1.00	0.14	1.20	0.91	0.74	0.56	2.09
Max	5.34	0.85	1.14	0.29	1.26	1.09	0.82	0.67	2.23
<i>O. montanus</i> ♀ (N = 5)									
Mean	5.11	0.75	0.98	0.36	1.20	0.96	0.78	0.64	1.97
SD	0.44	0.09	0.11	0.06	0.09	0.08	0.06	0.04	0.20
Range	1.01	0.24	0.25	0.16	0.19	0.20	0.17	0.08	0.42
Min	4.62	0.60	0.82	0.29	1.09	0.86	0.71	0.59	1.72
Max	5.63	0.84	1.07	0.44	1.28	1.06	0.88	0.67	2.14
<i>O. obliquus</i> ♀ (N = 5)									
Mean	5.81	0.74	1.16	0.33	1.29	1.07	0.76	0.70	2.33
SD	0.22	0.10	0.04	0.05	0.03	0.09	0.06	0.02	0.16
Range	0.61	0.28	0.10	0.13	0.07	0.22	0.14	0.04	0.40
Min	5.57	0.59	1.09	0.28	1.25	1.01	0.66	0.69	2.07
Max	6.18	0.87	1.20	0.41	1.32	1.23	0.80	0.73	2.46

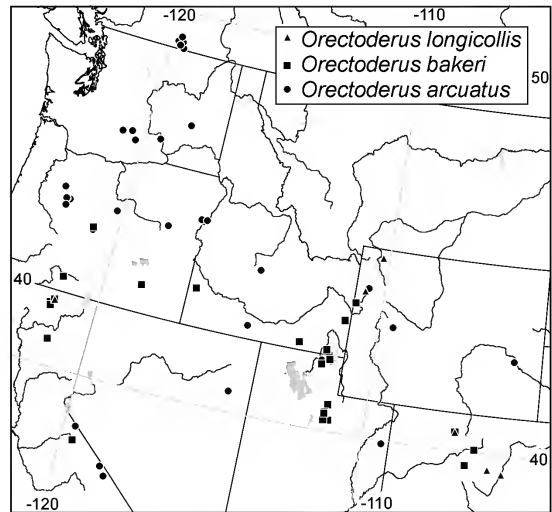
The vesica of *O. arcuatus* and *O. bakeri* is distinctly small compared to all other species within *Orectoderus* (fig. 5); *O. arcuatus* and *O. bakeri* are the only two species within *Orectoderus* where the corium sometimes shows a red coloration.

Two males among the examined specimens (Washington: Yakima Co.: Tampico, 00076104, ORSU; Toppenish, 00069140, USNM) show autotype labels from Knight, which are not mentioned in the original description.

SPECIMENS EXAMINED: **CANADA: British Columbia:** 4 mi E of Cawston, 49.19175°N 119.7237°W, 09 Jul 1959, L.A. Kelton, 2 ♀ (00072912, 00072913) (CNC). Mount Kobau, 11 km NW of Osoyoos Summit, 49.10316°N 119.57332°W, 1834 m, 30 Aug 1993, M.D. Schwartz, 2 ♀ (00072915, 00072916) (CNC). Oliver, 49.18333°N 119.55°W, 24 May 1959, E.E. MacDougall, 1 ♂ (00072911), 1 ♀ (00072070) (CNC); 25 May 1959, L.A. Kelton, 1 ♀ (00072243) (CNC); 14 May 1953, D.F. Hardwick, 1 ♂ (00072910) (CNC).

Oliver, White Lake, 49.18333°N 119.55°W, 23 May 1959, E.E. MacDougall, *Artemisia* sp. (Asteraceae), 1 ♂ (00072060) (CNC); 27 May 1959, E.E. MacDougall, 5 ♂ (00072061–00072065), 2 ♀ (00072066, 00072067) (CNC); 28 May 1959, L.A. Kelton, 23 ♂ (00071992–00072006, 00072010, 00072242, 00072252, 00123150–00123154), 29 ♀ (00072011–00072033, 00123163–00123168) (CNC); 28 May 1959, R.E. Leech, 22 ♂ (00071974–00071991, 00072007–00072009, 00072241), 13 ♀ (00072034–00072044, 00072244–00072245) (CNC); 25 May 1959, R.E. Leech, *Artemisia* sp. (Asteraceae), 1 ♀ (00072059) (CNC); 10 Jun 1959, E.E. MacDougall, 1 ♂ (00072068) (CNC); 10 Jun 1959, L.A. Kelton, 1 ♂ (00072069), 1 ♀ (00072253) (CNC). Osoyoos, 49.03333°N 119.46666°W, 900 m, 21 May 1953, D.F. Hardwick, 1 ♂ (00072048) (CNC). Osoyoos, Richter Pass, 49.03333°N 119.46666°W, 24 May 1959, R.E. Leech, 3 ♂ (00072049–00072051)

(CNC); 24 May 1959, L.A. Kelton, 2 ♂ (00072052, 00072053), 5 ♀ (00072054–00072058) (CNC); 22 May 1959, R.E. Leech, 1 ♂ (00072072) (CNC). Richter Pass, Osoyoos, 49.06666°N 119.58333°W, 22 May 1959, R.E. Leech, 3 ♀ (00072045–00072047) (CNC). White Lake, 53.86666°N 132.08333°W, 28 May 1959, L.A. Kelton, 1 ♀ (00072914) (CNC). **Manitoba:** 4.7 km E of Tolstoi off Rt 209, 49.0753°N 96.74362°W, 292 m, 07 Jul 1990, M.D. Schwartz and R. Footitt, 1 ♂ (00072254) (CNC). 5 km N of Spirit Sands, Spruce Wood Prov. Park, 19 km S of Carberry, 49.69609°N 99.35°W, 08 Jul 1990, M.D. Schwartz, 1 ♀ (00072255) (CNC). **USA: California: Alpine Co.:** Monitor Pass, 38.67556°N 119.61944°W, 10 Jul 1975, Stan Kuba, 1 ♂ (00077698) (CAS). **Mono Co.:** Blanco's Corral, White Mts., 37.81888°N 118.47638°W, 3048 m, 29 Jun 1953, J.T. Brooks, 1 ♂ (00079717) (UCB). White Mountains, 37.58333°N 118.26667°W, 3048 m, 26 Jun 1961, D.R. Miller, 1 ♂ (00074616) (UCD). **Siskiyou Co.:** 9 mi SW of Lava Beds National Monument on Medicine Lake Road, 41.66132°N 121.6287°W, 1829 m, 26 Jun 1979, M.D. Schwartz, *Purshia tridentata* (Rosaceae), 1 ♂ (00096917) (AMNH). Medicine Lake Road, 41.58167°N 121.59778°W, 1585 m, 26 Jun 1979, G. Stonedahl, *Purshia tridentata* (Rosaceae), 1 ♂ (00076188) (ORSU). **Colorado: Eagle Co.:** Vail, 39.64028°N 106.37361°W, 2591 m, 23 Jun 1986, J.T. Polhemus, *Symphoricarpos* sp. (Caprifoliaceae), 1 ♂ (00063497), 1 ♀ (00063498) (JTP); 24 Jun 1979, J.T. Polhemus, 1 ♀ (00063494) (JTP); 21 Jun 1980, J.T. Polhemus, 1 ♂ (00063493) (JTP). Vail, 39.64°N 106.37416°W, 24 Jun 1979, J.T. Polhemus, 1 ♂ (00096914), 1 ♀ (00096916) (AMNH). **Routt Co.:** Steamboat Springs, 40.485°N 106.83111°W, 2134 m, 23 Jul 1983, D.A. and J.T. Polhemus, *Symphoricarpos* sp. (Caprifoliaceae), 1 ♀ (00063496) (JTP). Steamboat Springs Strawberry Park nr. Hot Springs, 40.485°N 106.83111°W, 24 Jul 1983, J.T. and D.A. Polhemus, *Symphoricarpos* sp. (Caprifoliaceae), 1 ♂ (00063495) (JTP). **Idaho: Blaine Co.:** 16.5 miles NW Ketchum, 43.84958°N 114.59645°W, D.E. Foster, 1 ♂ (00086610) (UID). **Caribou Co.:** 6.3 mi E of Wayan, 42.97826°N 111.25136°W, 03 Jul 1953, W.F. Barr, 1 ♂ (00086633) (UID). **Twin Falls Co.:** Unknown, Twin Falls county, 42.35056°N 114.64361°W, 07 Jun 1927, Walter E. Peay, *Artemisia tridentata* (Asteraceae), 1 ♂ (00075383) (USU). **Nevada: Elko Co.:** E slope Spruce Mountain, 40.55227°N 114.81801°W, 26 Jun 1956, unknown, 2 ♂ (00096912, 00096913) (AMNH). **Oregon: Baker Co.:** 4 mi W of Unity, 44.43°N 118.27°W, 08 Jun 1970, Oman, *Artemisia tridentata*



MAP 1. Distribution of *Orectoderus arcuatus*, *O. bakeri*, *O. longicollis*.

(Asteraceae), 2 ♀ (00076124, 00076132) (ORSU). 6.5 mi east Richland, 44.76909°N 117.03491°W, 1113 m, 07 Jun 1970, Oman, 2 ♀ (00075978, 00075979) (ORSU). 6.5 miles E of Richland, 44.8°N 117.12°W, 07 Jun 1970, Oman, 3 ♂ (00076069–00076070, 00076119), 8 ♀ (00076121–00076123, 00076133–00076137) (ORSU); 04 Apr 1971, Oman, 1 ♂ (00076131) (ORSU). Brownlee, 44.81138°N 116.93416°W, 654 m, 12 Jun 1959, Kenneth Goeden, Light Trap, 1 ♂ (00068910) (USNM). **Deschutes Co.:** 1 mi S of Millican, 43.86471°N 120.91889°W, 1335 m, 21 Jun 1979, M.D. Schwartz, *Chrysanthemum nauseosus* (Asteraceae), 1 ♂ (00059319) (AMNH). Pine Mountain Observation, 43.80306°N 120.91278°W, 1829 m, 29 Jun 1978, J.D. Lattin, 1 ♂ (00076118) (ORSU). **Lane Co.:** H.J. Andrews Experimental Forest, ½ mile N Fissel Point, T15S R6E Sec 29 SE¼, 44.2325°N 122.1167°W, 1478 m, 30 Jul 1980, K.A. Phillips, 1 ♂ (00076076) (ORSU); 23 Jul 1980, G.M. Cooper, 1 ♂ (00076077) (ORSU); 17 Jul 1980, K.A. Phillips, 1 ♂ (00076078), 1 ♀ (00076183) (ORSU); 30 Jul 1980, G.M. Cooper, 1 ♂ (00076081), 3 ♀ (00076176–00076178) (ORSU); 23 Jul 1980, G.M. Cooper, 1 ♀ (00076179) (ORSU); 23 Jul 1980, K.A. Phillips, 1 ♀ (00076180) (ORSU). **Linn Co.:** HJ Andrews Experimental Forest, Carpenter Mountain, Access Road 1501 6.6 miles N Jct 1502–1501, 44.2325°N 122.1167°W, 1463 m, Eulensen & Searles, 1 ♀ (00076182) (ORSU). Iron Mountain, 6 mi E Upper Soda, 44.40632°N 122.16003°W, 1524 m, 11 Aug 1962, G.C. Eickwort, 2 ♂ (00076074, 00076079), 1 ♀ (00076184) (ORSU); 18 Jul 1962, G.C. Eickwort, 1 ♂ (00076075) (ORSU). Monument Peak, 21 Jul 1968, Kenneth Goeden, 1 ♂ (00076080) (ORSU). Monument Peak, 8 miles ESE Gates, 44.69472°N 122.32138°W, 1440 m, 16 Jun 1960, J.D. Lattin, 1 ♀ (00076181) (ORSU). Tombstone Prairie, 44.39528°N 122.13694°W, 19 Jul 1977, J.D. Lattin, *Polygonum* sp. (Polygonaceae), 1 ♂ (00076073) *Rubus* sp. (Rosaceae), 1 ♂ (00076072) (ORSU). Tombstone Prairie, 35 mi E of Sweet Home, 44.39778°N 122.02683°W, 1280 m, 15 Aug 1970, J.D. Lattin, 1 ♂ (00076071) (ORSU). **Wheeler Co.:** Ochoco NF North Pt. of Mount Pisgah, 44.45694°N 120.23638°W, 2074 m, 19 Jul 1979, M.D. Schwartz, 1 ♂ (00096915) (AMNH). **Utah: Cache Co.:** 14 mi S on FS Rd 055 off of Rt 89, USU For, T13N R4E Sec15, 41.8688°N 111.4844°W, 2591 m, 26 Jun 1981, M.D. Schwartz, *Artemisia tridentata* (Asteraceae), 2 ♂ (00096690, 00096692) (AMNH). Logan Canyon, 41.74027°N 111.79305°W, 1981 m, 05 Jul 1962, Tony G., 1 ♂ (00069319) (USNM). Smithfield Canyon North Ridge, North of Campground, T13N R2E, 41.8375°N 111.82611°W, 1981 m, 30 May 1981, M.D. Schwartz, 1 ♂ (00096693) (AMNH). Tony Grove Lake trail to White Pine Lake, T13N R3E, 41.89361°N 111.64361°W, 2560 m, 25 Jun 1981, M.D. Schwartz, *Artemisia tridentata* (Asteraceae), 1 ♀ (00096199) (AMNH). **Uintah Co.:** 5–10 mi SW of Bonanza, T10S R24E, Sec 18, 39.91888°N 109.30995°W, 1615 m, 07 May 1982, M.D. Schwartz, *Artemisia tridentata* (Asteraceae), 1 ♂ (00096691) (AMNH); 09 May 1981, M.D. Schwartz, *Artemisia tridentata* (Asteraceae), 1 ♂ (00095993) (AMNH). **Washington: Benton Co.:** Hanford Reservation A.E.C., Rattlesnake Ridge, 46.58389°N 119.38667°W, 08 May 1968, Wyatt W. Cone, *Artemisia tridentata* (Asteraceae), 1 ♂ (00175436) (WSU); 06 May 1966, Wyatt W. Cone, *Artemisia tripartita* (Asteraceae), 1 ♂ (00175437) (WSU). **Yakima Co.:** Tampico [46.53528°N 120.86611°W], 01 Jun 1932, A.R. Rolfs, 1; m, [autotype label from Knight, not mentioned in the original description] (00076104) (ORSU). Toppenish [46.3775°N 120.3075°W], 02 May 1926, E.W. Davis, 1 ♂ (00096196) (AMNH). 1 ♂ [autotype label from Knight, not mentioned in the original description] (00069140) (USNM); 02 May 1926, E.W. Davis, 2 ♂ (00096187, 00096188) (AMNH), 5 ♂ (00068913–00068915, 00069317–00069318) (USNM). Yakima, 46.60222°N 120.50472°W, 12 Jun 1931, A.R. Rolfs, 1 ♂ (00068911) (USNM). **Wyoming: Platte Co.:** Glendo, 42.50274°N 105.02608°W, 26 May 1961, R.J. Lavigne, 1 ♂ (00068912) (USNM). **Sublette Co.:** Lower Green Riv. Lk. Wind River Range, 43°N 109.5°W, 2438 m, 03 Aug 1959, F., P. and B. Rindge, 1 ♂ (00059321) (AMNH). **Teton Co.:** 11.2 miles W of Jackson, 43.49582°N 110.98423°W, 2571 m, 10 Jul 1973, Oman and Musgrave, 1 ♂ (00076117) (ORSU). Little Grass River, Teton county, 43.91667°N 110.58333°W, 07 Jul 1967, D.L. Parker, 1 ♂ (00075356) (USU).

*Orectoderus bakeri* Knight

Figures 3, 5, 6, 11; map 1; tables 1, 2

*Orectoderus bakeri* Knight, 1968a: 314 (new species); Polhemus, 1994: 130 (distribution, host).*Teleorhinus oregoni* Knight, 1968b: 66 (new species). NEW SYNONYMY.

TYPE MATERIAL (EXAMINED): *Orectoderus bakeri*: HOLOTYPE: Male: [USA: Colorado: Routt Co.] Steamboat Springs [40.485°N 106.83111°W], 2103 m, 11 Jul 1964, H.H. Knight (AMNH\_PBI 00069008) (USNM). PARATYPES: [USA: Colorado: Routt Co.] Steamboat Springs [40.485°N 106.83111°W], 2103 m, 15 Jul 1964, H.H. Knight, 1 ♂ (00096197) (AMNH).

*Teleorhinus oregoni*: HOLOTYPE: Male: [USA: Oregon: Klamath Co.] Summit of Bly Mountain [42.40389°N 121.43611°W] 17 Jun 1934, Joe Schuh (AMNH\_PBI 00068798) (USNM). PARATYPE: [USA: Oregon: Klamath Co.] Summit of Bly Mountain [42.40389°N 121.43611°W] 17 Jun 1934, Joe Schuh, 1 ♂ (00121388) (CNC).

DIAGNOSIS: For coloration of hemelytra, see *Orectoderus arcuatus*; males as well as females with pronotum bearing strong, erect, pale setae longer than diameter of first antennal segment; pronotum more rugose, not shiny; left paramere with anterior process not bearing distinct long setae on inner surface (fig. 6); common oviduct of female genitalia with sclerotized spots laterally (fig. 11). Similar to *O. arcuatus* in general aspect, vesica, and female genitalia, but distinguished by more rugose pronotum bearing strong, pale setae and anterior process of left paramere without distinct long seta on inner surface, as *O. arcuatus* (fig. 6) and in female by common oviduct with much smaller sclerotized spots laterally than in *O. arcuatus* and sclerotized rings of dorsal labiate plate more pointed apically (fig. 11); further the rather fuscous colored specimens similar to *O. montanus* but distinguished by the much stronger and erect pronotal setae in contrast to recumbent and fleecy pronotal setae in *O. montanus*, and vesica in *O. montanus* (fig. 5) much stronger than in *O. bakeri* (fig. 5).

REDESCRIPTION: *Male*: Total length 6.61–7.77, length apex clypeus-cuneus fracture 4.84–5.42, width across pronotum 1.36–1.64. COLORATION: Corium either brown with pale or reddish white band parallel to claval suture reaching apex of clavus or with pale band extending around inner apical angle of corium reaching to pale basal part of cuneus. SURFACE AND VESTITURE: General aspect rugose and dull; pronotum and scutellum rugose and dull; pronotum with strong, erect, pale setae longer than diameter of first antennal segment. STRUCTURE: Labium reaching to mesocoxa. GENITALIA: Anterior process of left paramere without distinct long seta on inner surface (fig. 6).

*Female*: Total length 5.12–5.62, width across pronotum 0.94–1.10. COLORATION: Head, pronotum, mesoscutum, scutellum, and hemelytra brown-orange. SURFACE AND VESTITURE: General aspect dull; pronotum bearing strong, erect, pale setae. STRUCTURE: Second antennal segment very strongly inflated distally (fig. 3). GENITALIA: Sclerotized rings of dorsal labiate plate rounded basally and apically; posterior wall with bifurcate interrampal sclerites, distinctly pointed medially (fig. 11).

HOSTS: *Artemisia cana*, *A. tridentata*, *Chrysothamnus viscidiflorus* (Asteraceae), *Lupinus* sp. (Fabaceae), and *Purshia tridentata* (Rosaceae).

**DISTRIBUTION:** United States: California, Colorado, Idaho, Oregon, Utah, and Wyoming (map 1). Knight (1968a) mentioned that *bakeri* is a species occurring mainly at higher elevations.

**DISCUSSION:** Knight (1968b) described *Teleorhinus oregoni* based on two males from the summit of Bly Mt. in Oregon. He distinguished this species from all other known *Teleorhinus* species by its dull, opaque pronotum, the only character he proposed. He apparently placed it in *Teleorhinus* because of its rugose pronotum and scutellum, a main character of *Teleorhinus*, and the completely fuscous dorsal surface. The holotype and paratype, the only known specimens of *T. oregoni*, present the following characters for transferring *oregoni* from *Teleorhinus* to *Orectoderus* and for synonymizing it with *bakeri*: the dull, distinct trapezoidal pronotum, the strong, pale, erect pronotal setae, and the form of the vesica and the left and right parameres.

The vesica of *O. bakeri* and *O. arcuatus* is distinctly smaller compared to that in all other species of *Orectoderus* (fig. 5); *bakeri* and *arcuatus* are the only two species within *Orectoderus* in which the corium sometimes shows a red coloration.

**SPECIMENS EXAMINED:** **USA: California: Mono Co.:** Sardine Creek, 38.30695°N 119.58989°W, 2591 m, 28 Jun 1951, P.D. Ashlock, 1 ♂ (00059323) (AMNH). **Shasta Co.:** Coyote Spring, 40.70527°N 121.37027°W, 1548 m, 16 Jun 1974, unknown, 1 ♂ (00076103) (ORSU). **Siskiyou Co.:** 9 mi SW of Lava Beds National Monument on Medicine Lake Road, 41.66132°N 121.6287°W, 1829 m, 26 Jun 1979, M.D. Schwartz, *Purshia tridentata* (Rosaceae), 3 ♂ (00059623, 00096039, 00096041) (AMNH). Medicine Lake Road, 41.58167°N 121.59778°W, 1585 m, 26 Jun 1979, G.M. Stonedahl, *Purshia tridentata* (Rosaceae), 1 ♂ (00075936) (ORSU); 26 Jun 1979, G. Stonedahl, 1 ♂ (00076098) *Purshia tridentata* (Rosaceae), 10 ♂ (00076090–00076095, 00076099–00076102) (ORSU). Just S of Lava Beds National Monument on Medicine Lake Road, Mammoth Crater, 41.75333°N 121.50556°W, 1625 m, 26 Jun 1979, R.T. and Joe Schuh, *Purshia tridentata* (Rosaceae), 6 ♂ (00096040, 00096042, 00096182, 00096184–00096186) (AMNH). **Colorado: Eagle Co.:** Vail, 39.64028°N 106.37361°W, 2591 m, 23 Jun 1986, J.T. Polhemus, *Artemisia tridentata* (Asteraceae), 5 ♂ (00063626–00063630), 8 ♀ (00063633–00063640) (JTP); 27 Jun 1978, J.T. Polhemus, 5 ♂ (00059324, 00059625, 00096179–00096181), 2 ♀ (00059626, 00059629) (AMNH); 24 Jun 1979, J.T. Polhemus, 2 ♂ (00059325, 00096178), 3 ♀ (00096175–00096177) (AMNH). 5 ♂ (00063654–00063658), 6 ♀ (00063659–00063664) (JTP); 21 Jun 1980, J.T. Polhemus, 1 ♂ (00096183), 2 ♀ (00059627, 00059628) *Artemisia tridentata* (Asteraceae), 1 ♂ (00059624) (AMNH). 12 ♂ (00063641–00063648, 00063668–00063671), 8 ♀ (00063649–00063653, 00063672–00063673, 00064750) (JTP). 1 ♂ (00058089), 1 ♀ (00058090) (TAMU); 22 Jun 1987, J.T. Polhemus, 1 ♀ (00063632) *Artemisia tridentata* (Asteraceae), 1 ♂ (00063631) (JTP); 23 Jun 1981, J.T. Polhemus, 1 ♀ (00063674) (JTP); 23 Jun 1980, J.T. Polhemus, 3 ♀ (00063665–00063667) (JTP). **Grand Co.:** Hot Sulphur Springs, 40.07306°N 106.10222°W, 13 Jul 1949, J.R. White, 1 ♂ (00074921) (KU). **Routt Co.:** Steamboat Springs, 40.485°N 106.83111°W, 2134 m, 01 Sep 1944, unknown, 1 ♂ (00074922) (KU). Steamboat Springs, 40.485°N 106.83111°W, 2103 m, 01 Jul 1944, unknown, 1 ♂ (00074923) (KU); 16 Jul 1964, H.H. Knight, 1 ♂ (00096189) (AMNH). **Idaho: Caribou Co.:** 6.3 mi E of Wayan, 42.97826°N 111.25136°W, 03 Jul 1953, W.F. Barr, 2 ♂ (00086614, 00086620) (UID). **Franklin Co.:** Cub River Canyon, 42.13601°N 111.69891°W, 11 Jul 1953, G.F. Knowlton, W.J. Hanson, E.A. Cross, 1 ♂ (00068984) (USNM). **Oneida Co.:** 4 mi NW of Holbrook, 42.2029°N 112.70834°W, 04 May 1922, G.F. Knowlton, 2 ♂ (00075385, 00075390) (USU). 5 mi NW of Holbrook, 42.21305°N 112.72206°W, 17 May 1972, W.J. Hansen, 1 ♂ (00075384) (USU). **Owyhee Co.:** Silver City,

43.01694°N 116.73222°W, 1890 m, 08 Jul 1973, C. Musgrave, 1 ♂ (00076088) (ORSU); 13 Jul 1967, A.R. Gittins, *Lupinus* sp. (Fabaceae), 1 ♂ (00086618) (UID). **Oregon: Deschutes Co.:** 1 mi S of Millican, 43.86471°N 120.91889°W, 1335 m, 21 Jun 1979, R.T. Schuh, *Chrysothamnus viscidiflorus* (Asteraceae), 1 ♂ (00059322) (AMNH). **Harney Co.:** Lily Lake, 13 mi E French Glen, 42.74611°N 118.66417°W, 2195 m, 10 Jul 1968, J. Lattin, 1 ♂ (00076097) (ORSU). **Utah: Cache Co.:** Franklin Basin, 41.9927°N 111.59744°W, 28 Jun 1974, W.J. Hanson, 1 ♂ (00075387) (USU); 16 Jul 1975, R.K. Cazier, 1 ♂ (00075388) (USU). Logan Canyon, 41.74028°N 111.79306°W, 26 Jun 1969, G.F. Knowlton, 1 ♂ (00075391) (USU). Logan Canyon, 41.7402°N 111.79383°W, 06 Jul 1908, unknown, 1 ♂ (00075389) (USU). Tony Grove Canyon, 41.89611°N 111.55278°W, 22 Jun 1983, G.F. Knowlton, 1 ♂ (00075392) (USU). **Summit Co.:** Beaver Creek, Kamas, 40.70247°N 111.34144°W, 04 Jul 1922, E.P. Van Duzee, 1 ♂ (00077696) (AMNH). **Wasatch Co.:** 15 miles S of Heber, 40.28955°N 111.4125°W, 06 Jun 1969, D.E. Foster, 1 ♂ (00086619) (UID). 20 miles SE Heber, Daniels Pass, 40.29694°N 111.25194°W, 2437 m, 07 Jun 1969, W.F. Barr, *Artemisia cana* (Asteraceae), 1 ♂ (00086616) (UID). Daniels Canyon, Heber, 40.47083°N 111.41389°W, 05 Jul 1922, E.P. Van Duzee, 1 ♂ (00077697) (CAS). Heber, 40.50689°N 111.41323°W, 06 Jun 1969, D.E. Foster, 1 ♂ (00086615) (UID). **Wyoming: Teton Co.:** 11.2 miles W of Jackson, 43.49582°N 110.98423°W, 2571 m, 10 Jul 1973, Oman and Musgrave, 1 ♂ (00076096) (ORSU).

*Orectoderus longicollis* Uhler

Figures 3, 5, 6, 11; map 1; tables 1, 2

*Orectoderus longicollis* Uhler, 1895: 47 (new species); Van Duzee, 1916b: 42 (list), 1917: 368 (catalog, distribution); Carvalho, 1958: 175 (catalog); Knight, 1968a: 313 (discussion); Knight, 1968b: 64 (distribution, figure of head and antenna, diagnosis); Polhemus, 1994: 130 (distribution, host).

TYPE MATERIAL (EXAMINED): *Orectoderus longicollis*: Holotype: Male: [USA: Colorado: Routt Co.: Steamboat Springs, 40.485°N 106.83111°W] Colo 1341 [Baker], *Lupinus* sp. (Fabaceae) (AMNH\_PBI 00068904) (USNM).

DIAGNOSIS: Recognized by coloration of hemelytra with clavus almost entirely pale, brown only proximally (fig. 3); vesica strongly sclerotized with wide denticulate lobe (fig. 5); left paramere with anterior process rounded apically (fig. 6); female with small sclerotized spots beyond apex of sclerotized rings of dorsal labiate plate (fig. 11, arrow). Most similar to *O. montanus* in general aspect, vestiture, and vesica, but distinguished by claval coloration, length difference between anterior and posterior process of left paramere (fig. 6), inner surface of anterior process of left paramere without long seta as in *O. montanus* (fig. 6) and vesica with denticulate lobe, in lateral view, concave (fig. 5, arrow).

REDESCRIPTION: *Male*: Total length 6.00–6.66, length apex clypeus-cuneus fracture 4.46–4.89, width across pronotum 1.28–1.44. COLORATION: Pronotum black, slightly greyish; clavus pale, brown just proximally and with very narrow brownish band along claval commissure; corium brown with pale band parallel to claval suture reaching apex of clavus. SURFACE AND VESTITURE: General aspect dull, rugose, and pubescent; pronotum and scutellum dull; dorsal surface clothed with pale setae; pronotum bearing fine, pale reclining setae shorter than diameter of first antennal segment. STRUCTURE: Labium reaching to mesocoxa. GENITALIA:

Anterior process of left paramere without distinct long seta on inner surface (fig. 6); secondary gonopore with large denticulate lobe, in lateral view, concave (fig. 5, arrow).

*Female*: Total length 5.11–5.34, width across pronotum 0.91–1.09. COLORATION: Head, pronotum, mesoscutum, scutellum, and hemelytra greyish brown (fig. 3); ocher band along claval suture. SURFACE AND VESTITURE: General aspect dull with greyish appearance; head and pronotum dull; pronotum clothed with fine, golden, shiny setae shorter than diameter of first antennal segment. STRUCTURE: Second antennal segment just slightly inflated distally (fig. 3). GENITALIA: Sclerotized rings of dorsal labiate plate rounded basally and tapering apically; small sclerotized spots beyond apex of sclerotized rings of dorsal labiate plate; posterior wall with bifurcate interramal sclerites, rounded medially (fig. 11).

HOSTS: *Symphoricarpos* sp. (Caprifoliaceae), *Lupinus* sp. (Fabaceae), and *Purshia tridentata* (Rosaceae).

DISTRIBUTION: United States: California, Colorado, and Wyoming (map 1).

DISCUSSION: Uhler (1895) described this species from a single male from Steamboat Springs, collected by Baker on July 14. The specimen in the collection of the USNM labelled “Colo. 1341” fits Uhler’s (1895) indication. “Colo. 1341” is Baker’s code for “Steamboat Spring, Colorado” (Tom Henry, personal commun.). Even though this specimen does not bear any type label, it is doubtless the holotype of *O. longicollis*.

*Orectoderus longicollis* is the only species within this genus with a pale clavus or, as Uhler (1895) specified it, with “clavus ivory white.”

SPECIMENS EXAMINED: **USA: California: Siskiyou Co.:** just S of Lava Beds National Monument on Medicine Lake Road, Mammoth Crater, 41.75333°N 121.50556°W, 1625 m, 26 Jun 1979, R.T. and Joe Schuh, *Purshia tridentata* (Rosaceae), 1 ♀ (00096889) (AMNH). **Colorado: Clear Creek Co.:** Mount Evans, 39.58056°N 105.59167°W, 3658 m, 14 Aug 1982, J.T. Polhemus, 2 ♀ (00064748, 00064749) (JTP). **Douglas Co.:** Waterton, 39.49361°N 105.08806°W, 07 Jul 1983, D.A. Polhemus, 2 ♀ (00064744, 00064745) (JTP). **Routt Co.:** Steamboat Springs, 40.485°N 106.83111°W, 2134 m, 23 Jul 1983, D.A. and J.T. Polhemus, *Symphoricarpos* sp. (Caprifoliaceae), 1 ♂ (00063511), 2 ♀ (00063516, 00063518) (JTP); 15 Jul 1964, H.H. Knight, 1 ♂ (00069328) (USNM); 23 Jul 1983, J.T. and D.A. Polhemus, *Symphoricarpos* sp. (Caprifoliaceae), 4 ♂ (00063675–00063676, 00064746–00064747), 5 ♀ (00063677, 00063773–00063776) (JTP). *Symphoricarpos* sp. (Caprifoliaceae), 1 ♂ (00092757), 1 ♀ (00092758) (TAMU); 27 Jun 1982, J.T. and D.A. Polhemus, 1 ♂ (00063685) *Symphoricarpos* sp. (Caprifoliaceae), 4 ♀ (00063769–00063772) (JTP); 01 Jul 1944, O.B., 2 ♂ (00074945, 00074946) (KU). Steamboat Springs, 40.485°N 106.83111°W, 2103 m, 11 Jul 1964, H.H. Knight, 2 ♂ (00068997, 00068998) (USNM); 15 Jul 1964, H.H. Knight, 2 ♂ (00096190, 00096191), 1 ♀ (00096192) (AMNH). Steamboat Springs Strawberry Park nr. Hot Springs, 40.485°N 106.83111°W, 24 Jul 1983, J.T. and D.A. Polhemus, *Symphoricarpos* sp. (Caprifoliaceae), 9 ♂ (00063509–00063510, 00063512–00063513, 00063678–00063682), 8 ♀ (00063514–00063515, 00063517, 00063683–00063684, 00064741–00064743) (JTP). **Wyoming: Park Co.:** Yellowstone National Park, 44.76667°N 110.23333°W, 08 Aug 1927, H.H. Knight, 1 ♀ (00069368) (USNM). **Teton Co.:** Jackson Lake Village, Grand Teton National Park, 43.83333°N 110.7°W, 23 Jul 1971, G.C. Steyskal, 1 ♀ (00069367) (USNM).

*Orectoderus montanus* Knight

Figures 3, 5, 6, 11; map 2; tables 1, 2

*Orectoderus montanus* Knight, 1968a: 315 (new species, description); Kelton, 1980: 289 (diagnosis, host, distribution, map).

*Orectoderus utahensis* Knight, 1968a: 315 (new species, description); Polhemus, 1994: 131 (distribution, host). NEW SYNONYMY.

*Orectoderus salicis* Knight, 1968a: 316 (new species, description, host); Polhemus, 1994: 131 (distribution, host). NEW SYNONYMY.

*Orectoderus cockerelli* Knight, 1968a: 317 (new species, description); Polhemus, 1994: 130 (distribution, host). NEW SYNONYMY.

TYPE MATERIAL (EXAMINED): *Orectoderus montanus*: HOLOTYPE: Male: [USA: Wyoming: Park Co.] Yellowstone National Park [44.76667°N 110.23333°W] 08 Aug 1927, H.H. Knight (AMNH\_PBI 00068975) (USNM). PARATYPE: [USA] Wyoming: Park Co.: Yellowstone National Park [44.76667°N 110.23333°W] 20 Jul 1920–25 Jul 1920 [1925 in original description], A.A. Nichol, 1 ♂ (00096918) (AMNH).

*Orectoderus utahensis*: HOLOTYPE: Male: [USA: Utah: Wasatch Co.] Heber [40.50689°N 111.41323°W] 1928, C.J.D. Brown (AMNH\_PBI 00069136) (USNM). PARATYPE: [USA: Colorado] 4 miles S of Grand Mesa, 09 Jul 1938, R. Bauer, 1 ♂ (00096193) (AMNH).

*Orectoderus salicis*: HOLOTYPE: Male: [USA: Colorado: Clear Creek Co.] Berthoud Pass [39.79805°N 105.77777°W] 3452 m, 17 Jul 1964, H.H. Knight (AMNH\_PBI 00069135) (USNM). PARATYPES: [USA: Colorado: Clear Creek Co.] Berthoud Pass [39.79805°N 105.77777°W] 3452 m, 17 Jul 1964, H.H. Knight, 1 ♂ (00096919) (AMNH).

*Orectoderus cockerelli*: HOLOTYPE: Male: [USA: Colorado: Teller Co.] Florissant [38.94555°N 105.28916°W], Jul 1916, T.D.A. Cockerell, *Potentilla fruticosa* (Rosaceae) (AMNH\_PBI 00068981) (USNM).

DIAGNOSIS: Recognized by greyish aspect of pronotum (fig. 3), golden, shiny pubescent setae on pronotum and wide and strongly sclerotized vesica (fig. 5); most similar to *O. longicollis* in vesica and pronotum shape and pronotal vestiture, distinguished by its brown clavus and pale band parallel to claval suture; female with large sclerotized rings, pointed apically (fig. 11). In general aspect, vesica and vestiture similar to *montanus*, but distinguished by left paramere with long seta on inner surface of anterior process (fig. 6), and vesica with denticulate lobe, in lateral view, straight (fig. 5, arrow).

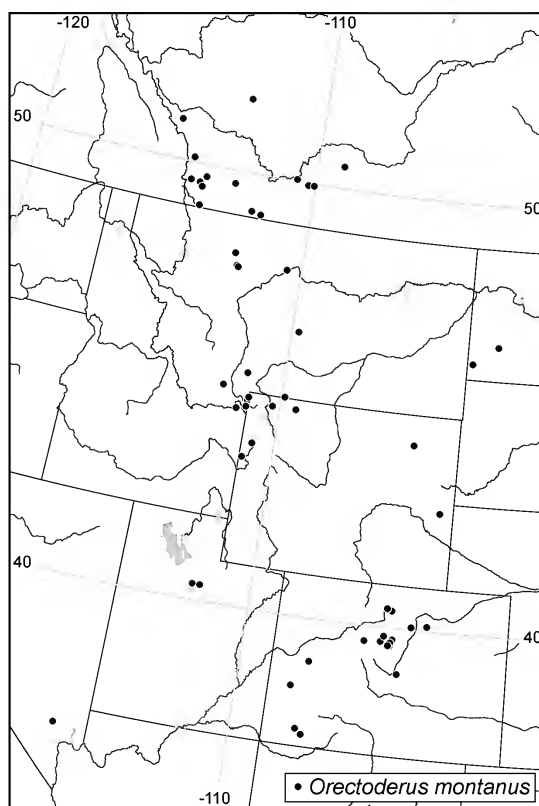
REDESCRIPTION: *Male*: Total length 5.45–6.71, length apex clypeus-cuneus fracture 3.82–5.00, width across pronotum 1.23–1.48. COLORATION: Clavus brown with narrow pale band parallel to claval suture (fig. 3); corium brown with pale band parallel to claval suture usually ending just right before or slightly reaching apex of clavus. SURFACE AND VESTITURE: General aspect rugose, pubescent and faintly shiny; pronotum and scutellum faintly shiny; dorsal surface and pronotum bearing fine, pale reclining setae shorter than diameter of first antennal segment. STRUCTURE: Labium reaching to mesocoxa. GENITALIA: Secondary gonopore with large denticulate lobe, in lateral view, straight (fig. 5); anterior process of left paramere bearing distinct long seta on inner surface (fig. 6).

*Female*: Total length 4.62–5.63, width across pronotum 0.91–1.09. COLORATION: Head, pronotum, mesoscutum, scutellum and hemelytra greyish brown (fig. 3). SURFACE AND VESTITURE: General aspect dull; head and pronotum dull; pronotum clothed with fine, pale setae. STRUCTURE: Second antennal segment just slightly inflated distally (fig. 3). GENITALIA: Sclerotized rings of dorsal labiate plate large, elongate, and pointed apically; posterior wall with bifurcate interramal sclerites, almost straight medially (fig. 11).

Hosts: *Chrysothamnus nauseosus* (Asteraceae), *Symphoricarpos* sp. (Caprifoliaceae), and *Potentilla fruticosa* (Rosaceae).

DISTRIBUTION: Canada: Alberta, Saskatchewan. United States: Colorado, Idaho, Montana, Nevada, North Dakota, Utah, and Wyoming (map 2).

DISCUSSION: The shape of the pronotum among specimens of *Orectoderus montanus* is slightly variable, but always more or less distinctly campanulate with the outer distal margin concave. Examination of the holotype and paratype of *O. utahensis*, holotype and paratype of *O. salicis* Knight, and the holotype of *O. cockerelli* (the only known specimen) suggests that these nominal species are the same as *montanus*. Their general aspect, vestiture, and second antennal segment do not show any differences, and I am therefore treating the first three as junior synonyms of the last, new synonymy. *O. montanus*, *O. cockerelli*, *O. salicis*, and *O. utahensis* were described in the same publication (Knight, 1968a). The last three species have not been discussed subsequently, whereas *O. montanus* was redescribed by Kelton (1980). For this reason, maintaining nomenclatorial stability, *O. montanus* is chosen here as senior synonym.



MAP 2. Distribution of *Orectoderus montanus*.

SPECIMENS EXAMINED: **CANADA: Alberta:** Clarinda, 49.09566°N 111.74316°W, 960 m, 15 May 1952, L.A. Konotopetz, 1 ♀ (00059622) (AMNH). 3 ♂ (00072872–00072873, 00123239) (CNC). Cowley, 49.56666°N 114.06666°W, 18 Jun 1952, L.A. Konotopetz, 2 ♂ (00123237, 00123238), 2 ♀ (00072868, 00072869) (CNC); 18 Jun 1952, A.R. Brooks, 1 ♂ (00072870) (CNC). Frank, 49.6°N 114.4°W, 18 Jun 1952, L.A. Konotopetz, 1 ♂ (00072885) (CNC). Irvine, 49.95°N 110.26666°W, 11 Jun 1952, L.A. Konotopetz, 1 ♂ (00072246) (CNC); 11 Jun 1952, A.R. Brooks, 1 ♀ (00059315) (AMNH). 3 ♂ (00072874–00072875, 00123241) (CNC); 11 Jun 1952, L.A. Konotopetz, 4 ♂ (00072876–00072879) (CNC). Kananaskis Hwy, 50.91555°N 115.14166°W, 25 Jul 1973, L.A. Kelton, 3 ♂ (00072249, 00072901, 00123235) (CNC). Kananaskis Rd., 50.91555°N 115.14166°W, 20 Jul 1975, L.A. Kelton, 4 ♂ (00072897–00072900) (CNC); 21 Jul 1974, L.A. Kelton, 1 ♂ (00072896) (CNC); 27 Jul 1974, L.A. Kelton, 1 ♂ (00123232) (CNC).

Lethbridge, 49.7°N 112.83333°W, 05 Jun 1930, J.H. Pepper, 1 ♂ (00072905) (CNC); 17 Jul 1949, L.K. Peterson, 1 ♂ (UASM). Livingstone Falls, Livingstone River, 50.10138°N 114.44166°W, 17 Jul 1964, H.B. Leech, 1 ♀ (00077695) (AMNH). Medicine Hat, 50.03333°N 110.68333°W, unknown, 2 ♂ (00072894, 00072895) (CNC); 15 Jun 1930, J.H. Pepper, 3 ♂ (00072890–00072892) (CNC); 14 Jun 1930, J.H. Pepper, 4 ♂ (00072888–00072889, 00123233–00123234) (CNC). Milk River, 49.13333°N 112.08333°W, 16 Jun 1952, A.R. Brooks, 1 ♂ (00072902) (CNC). Morrin, 51.66666°N 112.76666°W, 27 Jun 1939, P.J.G. Rock, 1 ♂ (00072871) (CNC). Pincher, 49.48333°N 113.95°W, 09 Jul 1941, R.W. Salt, 1 ♂ (00072906) (CNC). Spring Point, 59.43333°N 109.73333°W, 18 Jun 1952, L.A. Konotopetz, 2 ♂ (00072886, 00072887) (CNC). Walsh, 49.95°N 110.03333°W, 28 May 1952, A.R. Brooks, 2 ♂ (00072880, 00072881) (CNC); 28 May 1952, L.A. Konotopetz, 2 ♂ (00072247, 00072248) (CNC). Waterton Lakes National Park, 49.05°N 113.9°W, 04 Jul 1923, J. McDunnough, 1 ♂ (00096202) (AMNH); 04 Jun 1970–06 Jun 1970, L.A. Kelton, 2 ♂ (00072903, 00072904) (CNC). Waterton Park, 49.05°N 113.91666°W, 04 Jul 1970–06 Jul 1970, L.A. Kelton, 1 ♂ (00123236) (CNC). **Saskatchewan:** Great Sand Hills, 50.5°N 109.08333°W, 04 Jul 1952, A.R. Brooks, 1 ♂ (00072893) (CNC). **USA: Colorado: Clear Creek Co.:** Echo L. 10, Mount Evans, 39.65832°N 105.60333°W, 183 m, 13 Jul 1961, J.R. Stainer, 5 ♂ (00072590–00072594), 3 ♀ (00072595–00072597) (CNC); 19 Jul 1961, J.R. Stainer, 7 ♂ (00072598–00072604) (CNC); 26 Jul 1961, J.R. Stainer, 6 ♂ (00072605–00072610), 4 ♀ (00072611–00072614) (CNC); 26 Jul 1961, B.H. Poole, 2 ♂ (00072615, 00072616), 1 ♀ (00072617) (CNC); 12 Jul 1961, W.R.M. Mason, 1 ♀ (00072618) (CNC); 20 Jul 1961, B.H. Poole, 2 ♂ (00072619, 00072620) (CNC). Mount Evans, 39.58056°N 105.59167°W, 3658 m, 14 Aug 1982, J.T. Polhemus, 2 ♂ (00059318, 00096201), 2 ♀ (00096895, 00096896) (AMNH). 21 ♂ (00063807–00063827) (JTP); 14 Aug 1982, J.T. and D.A. Polhemus, 2 ♂ (00063796, 00063797) (JTP); 19 Jul 1980, J.T. Polhemus, 1 ♂ (00096038), 1 ♀ (00096893) (AMNH). 4 ♂ (00063803–00063806) (JTP). Mount Evans, 39.58859°N 105.64333°W, 4267 m, 25 Jul 1961, B.H. Poole, 1 ♂ (00072621), 2 ♀ (00072622, 00072623) (CNC); 04 Jul 1961, C.H. Mann, 1 ♂ (00072631), 1 ♀ (00072625) (CNC); 29 Jul 1961, C.H. Mann, 1 ♀ (00072626) (CNC); 03 Aug 1961, B.H. Poole, 1 ♂ (00072632) (CNC). Mount Goliath Natural Area, 39.63833°N 105.59444°W, 3414 m, 21 Aug 1986, R.T. Schuh and J.T. Polhemus, 1 ♂ (00096927) *Potentilla fruticosa* L. (Rosaceae), 3 ♂ (00059320, 00096035–00096036), 21 ♀ (00058500, 00059317, 00096703–00096706, 00096897–00096911) (AMNH); 21 Aug 1982, D.A. and J.T. Polhemus, 2 ♂ (00096929, 00096930), 1 ♀ (00096707) (AMNH). 1 ♂ (00063798), 1 ♀ (00063799) (JTP). 1 ♀ (00092949) (TAMU); 14 Aug 1982, D.A. and J.T. Polhemus, 1 ♀ (00096894) (AMNH). 1 ♂ (00063802) (JTP); 08 Aug 1983, D.A. and J.T. Polhemus, 1 ♀ (00092950) (TAMU). Timberline, II, Mt. Evans, 39.58859°N 105.64333°W, 183 m, 21 Jul 1961, J.R. Stainer, 1 ♂ (00072624) (CNC); 11 Jul 1961, J.R. Stainer, 2 ♂ (00072627, 00072628), 1 ♀ (00072629) (CNC); 11 Jul 1961, S.M. Clark, 1 ♂ (00072630) (CNC). below Goliath Peak, 39.73574°N 105.52289°W, 3414 m, 21 Aug 1986, D.A. and J.T. Polhemus, *Potentilla fruticosa* (Rosaceae), 1 ♂ (00063487), 2 ♀ (00063488, 00063489) (JTP); 08 Aug 1982, D.A. and J.T. Polhemus, 1 ♂ (00063800), 1 ♀ (00063801) (JTP); 08 Aug 1983, D.A. and J.T. Polhemus, 1 ♀ (00092759) (TAMU). **Eagle Co.:** Vail, 39.64028°N 106.37361°W, 2591 m, 23 Jun 1986, J.T. Polhemus, *Symphoricarpos* sp. (Caprifoliaceae), 4 ♂ (00063786–00063789), 7 ♀ (00063492, 00063790–00063795) (JTP). **La Plata Co.:** Durango, Junction Creek Road, 37.28763°N 107.87562°W, 09 Jul 1968, E.C. Becker, 2 ♂ (00072560, 00072561) (CNC). La Plata, San Juan National Forest, 37.39722°N 108.0625°W, 2591 m, 19 Jul 1968–21 Jul 1968, L.A. Kelton, 1 ♂ (00072562) (CNC). **Larimer Co.:** Fall River Pass, 40.44027°N 105.75472°W, 488 m, 12 Aug 1948, H.G. & D. Townes, 1 ♂ (00069375), 1 ♀ (00068952) (USNM). Fall River Rd, Rocky Mountains National Park, 40.40445°N 105.62513°W, 2896 m, 16 Aug 1968–18 Aug 1968, L.A. Kelton, 2 ♂ (00072668, 00072669), 2 ♀ (00072670, 00072671) (CNC). **Mesa Co.:** 4 miles S of Grand Mesa, 09 Jul 1938, U. Latham, 2 ♂ (00068905, 00068906) (USNM). **Montrose Co.:** 2 mi S Columbine Pass, 38.38822°N 108.38056°W, 05 Jul 1980, J.T. and D.A. Polhemus, 5 ♂ (00063777–00063781), 3 ♀ (00063782–00063784) (JTP). **Sum-**

**mit Co.:** Loveland Pass W slope, 39.66361°N 105.87861°W, 3002 m, 08 Aug 1961, B.H. Poole, 4♂ (00072556–00072559) (CNC). **Teller Co.:** Florissant, 38.94555°N 105.28916°W, 29 Jul 1941, Wm. Buren, 1♂ (00068908) (USNM). **Weld Co.:** Brainard Lake, Roosevelt National Forest, 40.05111°N 104.9825°W, 3139 m, 02 Aug 1968, L.A. Kelton, *Potentilla* sp. (Rosaceae), 17♂ (00072633–00072649), 18♀ (00072650–00072667) (CNC). Keenesburg, Sandhill, 40.10833°N 104.51944°W, 11 Jun 1961, B.H. Poole, 2♂ (00072554, 00072555) (CNC). **Idaho: Unknown Co.:** Henrys, 2134 m, 12 Jul 1936, R.E. Miller, 1♂ (00068907) (USNM). **Montana: Chouteau Co.:** Loma, 47.93666°N 110.50333°W, 785 m, 10 Jun 1959, A.R. Gittins, 1♂ (00086613) (UID). **Gallatin Co.:** 55 miles S Bozeman, 44.88°N 111.05°W, 11 Jul 1973, Oman and Musgrave, 1♂ (00076084) (ORSU). 63 miles S of Bozeman, 44.81°N 111.09°W, 11 Jul 1973, Oman and Musgrave, 2♂ (00076083, 00076190), 3♀ (00076087, 00076125, 00076185) (ORSU). Gallatin Canyon, 45.43916°N 111.23138°W, 1652 m, 31 Jul 1954, R.C. Froeschner, 1♂ (00096208) (AMNH). West Yellowstone, 44.66215°N 111.1041°W, 2031 m, 03 Aug 1950, R.R. Dreisbach and R.K. Schwab, 1♂ (00127355) (MSU). **Madison Co.:** 15 mi S of Virginia City, West Fork Camp, 45.07703°N 111.94528°W, 23 Jul 1982, S.E. Cummings, 1♂ (00086842) (UNHP). **Park Co.:** Colter Campground, 2 mi E Cooke City on Rt 212, 45.01667°N 109.89242°W, 2438 m, 11 Aug 1986, Schuh, Schwartz, and Stonedahl, 1♂ (00096926) (AMNH). **Teton Co.:** 25 mi N of Choteau, 48.12°N 112.36°W, 30 Jun 1955, R.C. Froeschner, 3♂ (00096203–00096205) (AMNH). 4 mi N of Choteau, 47.85°N 112.23°W, 30 Jun 1955, R.C. Froeschner, 2♂ (00096206, 00096207) (AMNH). Choteau, 47.81333°N 112.18138°W, 1164 m, 28 Jun 1955, R.C. Froeschner, 2♂ (00096209, 00096210) (AMNH). **Wheatland Co.:** 8 mi N Harlowton, 46.551°N 109.77°W, 01 Jul 1955, R.C. Froeschner, 1♂ (00096211) (AMNH). **Nevada: Clark Co.:** Top of Las Vegas Range, 36.57139°N 115.03556°W, 28 Jun 1902, N.M., 2♂ (00076934, 00076935) (CUIC). **North Dakota: Slope Co.:** 4 mi N of Marmath, 46.31666°N 103.83333°E, 26 Jun 2000, T.J. Henry, *Chrysanthamnus nauseosus* (Asteraceae), 1♂ (00177734), 1♀ (00177735) (USNM). **Stark Co.:** 127 R Ave. 4 mi N of 48 R St. SW [9 mi S of South Heart], 46.73333°N 103.01666°W, 27 Jun 2000, T.J. Henry, 1♂ (00177736), 2♀ (00177737, 00177738) (USNM). **Utah: Utah Co.:** American Fork Canyon, 40.37694°N 111.795°W, 25 Jul 1973, G.F. Knowlton, 1♂ (00075469) (USU). North Fork Provo Canyon, 40.36467°N 111.55658°W, Vasco Tanner, 1♂ (00096200) (AMNH). **Wyoming: Campbell Co.:** Wyodak Plant Station, Gillette, 44.292°N 105.5°W, 24 May 1977, D. Molnar, 1♂ (00096928) (AMNH). **Niobrara Co.:** Lusk, 42.7625°N 104.45167°W, 21 May 1950, Esselbaugh, 6♂ (00096029–00096033, 00096925) (AMNH). **Park Co.:** Canyon Village, Yellowstone Natl. Park, 44.76667°N 109.465°W, 21 Jul 1971, G.C. Steyskal, 1♂ (00068983) (USNM); 12 Aug 1918, A.L. Melander, 1♂ (00068909) (USNM). Yellowstone National Park, 44.76667°N 110.23333°W, 20 Jul 1920–25 Jul 1920, A.A. Nichol, 1♂ (00069374) (USNM). **Teton Co.:** Grand Teton National Park, 43.83333°N 110.7°W, 07 Aug 1972, L.A. Kelton, 2♂ (00072907, 00072908) (CNC). Teton Pass, 43.4975°N 110.95444°W, 06 Aug 1972, L.A. Kelton, 1♀ (00072909) (CNC).

### *Orectoderus obliquus* Uhler

Figures 3, 4, 5, 6, 12; map 3; tables 1, 2

*Orectoderus obliquus* Uhler, 1876: 320 (new species, original description); Gillette and Baker, 1895: 47 (distribution); Kuhlitz, 1902: 1096, 1103, 1131, 1132, 1149 (notes); Van Duzee, 1916b: 42 (list), 1917: 368 (catalog, distribution); Knight, 1923: 426, fig. 16, 475 (description), 1941: 21, fig. 46 (claw); 23, fig. 76 (tarsi); 24, fig. 80 (antenna); 52, (description, distribution, host); 1968a: 311–313 (diagnosis, key to males, discussion); Blatchely, 1926: 916 (key, description), 917 (description, distribution, host); Procter, 1946: 77 (distribution, host); Froeschner, 1949: 135 (redescription), 162 (distribution); Carvalho, 1958: 175–176 (catalog); Kelton, 1959: 47 (description of male genitalia),

fig. 129 (male genitalia); Bliven, 1962: 59 (note); Akingbohunge et al., 1973: 16 (description of fifth instar nymph); Akingbohunge, 1974: 252 (chromosome number); Kelton, 1980: 288 (diagnosis, host, distribution, figure, map); Akingbohunge, 1983: 39 (testis follicle no.); McIver and Stonedahl, 1987b: 278 (biology, nymphs, figures); Polhemus, 1994: 130 (distribution, host); Scudder, 1997: 270 (distribution, host); Wyniger et al., 2008: 331 (presence of brochosomes), 335, fig. 4A (detail of pygophore).

*Orectoderus niger* Reuter, 1912: 47 (new species, description; syn. by Carvalho, 1955b: 225); Schouteden, 1913: 156 (note, distribution).

*Orectoderus obliquus* var. *ferrugineous* Knight, 1923: 475 (new variation).

*Orectoderus ruckesi* Knight, 1968a: 318 (new species, description). NEW SYNONYMY.

TYPE MATERIAL (EXAMINED): *Orectoderus obliquus*: LECTOTYPE: Male: [USA] Massachusetts (AMNH\_PBI 00068805) (USNM).

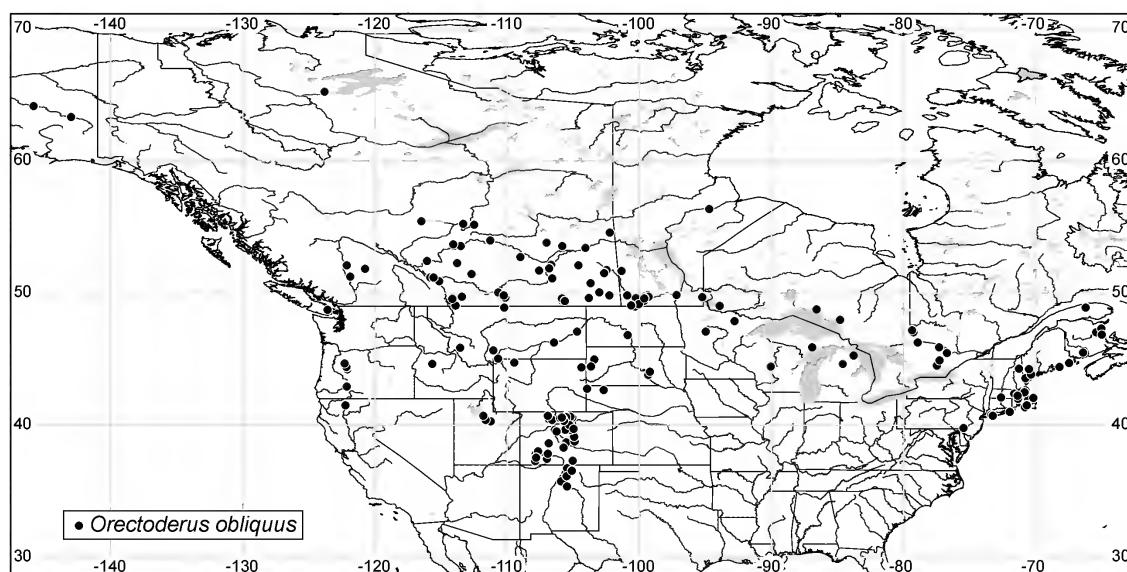
*Orectoderus obliquus* var. *ferrugineous*: HOLOTYPE: Female: USA: New York [Suffolk Co.] Bayshore, Long Island [40.725°N 73.24527°W] 5 m, 04 Jul 1915–07 Jul 1915, Chris. E. Olsen (AMNH\_PBI 00069138) (USNM). PARATYPE: Female: [USA] New York [Suffolk Co.] Bayshore, Long Island [40.725°N 73.24527°W, 5 m] 04 Jul 1915–07 Jul 1915, Chris. E. Olsen (00069139) (USNM). Knight (1923: 475) did not mention the year 1915 in his original description.

*Orectoderus ruckesi*: HOLOTYPE: Male: USA: Wyoming: Sublette Co.: Green River Lake, Wind River Mountains [42.70856°N 109.12818°W], 01 Aug 1935–09 Aug 1935, H. Ruckes (AMNH\_PBI 00069137) (USNM). In the original description of Knight (1968a: 318) the collecting date is recorded as “1–8 Aug, 1935,” on the original holotype label the date reads “1–9 Aug 1935.”

DIAGNOSIS: Hemelytra coloration slightly variable. Distinguished from all other species by body length (table 1), length of second antennal segment (table 1); general aspect of pronotum very shiny, and with fine, golden reclining setae (fig. 3); vesica in dorsolateral view strongly curved apically and basally (fig. 5); anterior process of left paramere round apically (fig. 6); female with distinct longer second antennal segment than all other species within *Orectoderus* (table 2), genitalia with sclerotized rings more round (fig. 12) and pronotum, in lateral view, almost flat (fig. 3).

REDESCRIPTION: *Male*: Total length 6.96–8.45, length apex clypeus-cuneus fracture 5.09–5.96, width across pronotum 1.62–1.76. COLORATION: Clavus either completely brown or brown with pale narrow band along claval suture; corium either completely brown or brown with pale band along claval suture, usually not reaching to apex of clavus; cuneus either completely brown or brown with basal half pale. SURFACE AND VESTITURE: General aspect very shiny; pronotum and scutellum slightly rugose; pronotal setae golden, shiny, distinctly shorter than diameter of first antennal segment; dorsal surface clothed with golden, shiny setae. STRUCTURE: Labium reaching to metacoxa. GENITALIA: Vesica, in dorsolateral view, strongly curved (fig. 5); anterior process of left paramere bearing distinct long seta on inner surface (fig. 6); right paramere slightly hook shaped apically (figs. 4E, 5).

*Female*: Total length 5.57–6.18, width across pronotum 0.66–0.80. COLORATION: Head, pronotum, mesoscutum, scutellum, and hemelytra orangish brown or dorsal surface completely black (fig. 3); first tergite black; second tergite with very narrow whitish band proxi-



MAP 3. Distribution of *Orectoderus obliquus*.

mally; all other tergites black. SURFACE AND VESTITURE: General aspect very shiny; pronotum clothed with fine, golden, shiny reclining setae. STRUCTURE: Calli of pronotum almost flat (fig. 3; lateral view); second antennal segment just slightly gradually inflated distally. GENITALIA: Sclerotized rings of dorsal labiate plate large, ovoid and slightly pointed apically, with sclerotized spots distally (fig. 12); posterior wall with bifurcate interrampal sclerites, almost straight medially (fig. 12).

HOSTS: *Artemisia cana*, *Aster macrophylla* (Asteraceae), *Symphoricarpos occidentalis*, *S. oreophilus* (Caprifoliaceae), *Juniperus communis* (Cupressaceae), *Kalmia* sp. (Ericaceae), *Lupinus* sp. (Fabaceae), *Ribes* sp. (Grossulariaceae), *Comptonia asplenifolia*, *C. peregrina* (Myricaceae), *Cercocarpus montanus*, *Potentilla fruticosa*, *Rosa* sp. (Rosaceae), *Galium boreale* (Rubiaceae), *Salix* sp. (Salicaceae).

DISTRIBUTION: Widely distributed throughout North America (map 3).

DISCUSSION: Uhler (1876) described *Orectoderus obliquus* based on several specimens from different localities without designating a holotype. The male specimen in the type collection of the USNM (AMNH\_PBI 00068805) is designated here as lectotype, for stabilizing the nomenclature. Knight (1923) described *O. obliquus* var. *ferrugineus* based on a color variation of the distal part of the second antennal segment and of the globose portion of the abdomen. Comparing the holotype and paratype of *O. obliquus* var. *ferrugineus* with females of *O. obliquus* showed that the mentioned characters can be found in the same form among females of *O. obliquus* in general, and I am therefore treating *O. obliquus* var. *ferrugineus* as junior synonym of *O. obliquus*, new synonymy. Knight (1968a) described *Orectoderus ruckesi* based on a single male from Wyoming, mentioning that it is allied to *O. obliquus*. He distinguished this species from the latter by the nearly flat pronotum. Comparing the *O. ruckesi* specimen with a series of *O. obliquus* specimens showed that the pronotal shape and vestiture are

essentially the same, and I am therefore treating the former as junior synonyms of the latter, new synonymy.

Among material from Michigan State University was a specimen of *Orectoderus* labeled as follows: "Paratype *O. nitidulus*, det. Hussey, 1953." *Orectoderus nitidulus* is an unpublished manuscript name; the specimen clearly is *O. obliquus*.

The vestiture of this species is characterized by several authors in different ways: Blatchley (1926) and Knight (1941) described the setae of the corium as yellowish hair/pubescent, whereas Kelton (1980) used the term short, black pubescence. In the original description by Uhler (1890) the hemelytra were described as vaguely pubescent.

McIver and Stonedahl (1987b) pointed out that males from east of and in the Rocky Mountains sometimes have completely black hemelytra and that possibly males from western populations have a white mark on the corium.

Knight (1941) mentioned that *Orectoderus obliquus* is usually associated with grasses and herbaceous plants; it occurs on the ground and is associated with ants. The work of McIver and Stonedahl (1987b) recorded for the first time the biology and the ant mimicry that is highly evolved within the genus *Orectoderus*. They also recorded the breeding host of *obliquus*, *Pentstemon procerus brachycanthus* (Pennell) Cronq.

*Orectoderus niger* was described by Reuter (1912), and wrongly listed by Schouteden (1913) for Brazil.

**SPECIMENS EXAMINED: CANADA: Alberta:** 3.8 km S of Drumheller on Rt. 56, 51.42762°N 112.64248°W, 677 m, 14 Jul 1990, M.D. Schwartz and R. Foottit, *Galium boreale* L. (Rubiaceae), 1 ♀ (00072583) (CNC). 8 miles S of Irvine, 49.83425°N 110.26666°W, 23 Jun 1959, A.R. Gittins, 2 ♂ (00086611, 00086636) (UID). Banff, 51.16666°N 115.56666°W, 1615 m, 05 Aug 1925, O. Bryant, 1 ♂ (00082777) (UCR). Banff National Park, 11 mi W of Banff, 51.16639°N 115.82042°W, 1372 m, 13 Jul 1955, R. Coyles, 1 ♂ (00072218) (CNC). Banff National Park, Banff-Jasper Hwy, 51.16666°N 115.56666°W, 25 Aug 1970, L.A. Kelton, 1 ♂ (00072233) (CNC). Bilby, 53.7°N 114.1°W, 11 Jul 1924, O. Bryant, 1 ♂ (00096923) (AMNH). Cypress Hills, 49.63°N 110.2°W, 28 Jun 1939, W.S. McLeod., 1 ♂ (UASM). Cypress Hills Provincial Park, Top Road, 1.2 km E of Spruce Coulee, 49.63°N 110.2°W, 1433 m, 15 Jul 1990, M.D. Schwartz, *Potentilla fruticosa* (Rosaceae), 3 ♂ (00072563–00072565), 6 ♀ (00072566–00072571) (CNC). Cypress Hills Provincial Park, Top Road, 9.6 km E of Rt 41 jct, 49.63°N 110.2°W, 1433 m, 15 Jul 1990, M.D. Schwartz, *Potentilla fruticosa* L. (Rosaceae), 1 ♀ (00072585) (CNC). Drumheller, 51.46666°N 112.7°W, 14 Jun 1946, W.R.M. Mason, 3 ♂ (UASM). Edmonton, 53.55°N 113.5°W, 21 Jun 1919, unknown, 1 ♂ (00068943) (USNM); 08 Jun 1963, L. Kenakin, 1 ♂ (UASM); 12 Jul 1946, E.H. Strickland, 1 ♂ (UASM). Elkwater, 49.63°N 110.2°W, 13 Jun 1952, A.R. Brooks, 3 ♂ (00072222, 00072769–00072770) (CNC); 06 Jun 1952, A.R. Brooks, 1 ♂ (00072771) (CNC). Elkwater Park, Cypress Hills Provincial Park, 49.63°N 110.2°W, 29 Jul 1952, L.A. Konotopetz, 1 ♂ (00072154) (CNC); 20 Jul 1952, L.A. Konotopetz, 1 ♂ (00072155) (CNC); 16 Jul 1952, L.A. Konotopetz, 2 ♂ (00072156, 00123159) (CNC); 15 Aug 1952, L.A. Konotopetz, 1 ♂ (00072157) (CNC); 26 Jul 1952, L.A. Konotopetz, 1 ♂ (00072158) (CNC); 13 Jun 1952, L.A. Konotopetz, 2 ♂ (00072159, 00072160) (CNC); 14 Aug 1952, A.R. Brooks, 1 ♂ (00072804) (CNC); 13 Jul 1952, L.A. Konotopetz, 1 ♂ (00072805) (CNC); 16 Jul 1952, A.R. Brooks, 1 ♂ (00072806) (CNC). High Prairie, 55.43333°N 116.48333°W, 17 Jul 1961, A.R. Brooks, 1 ♀ (00072803) (CNC); 22 Jun 1961, A.R. Brooks, 2 ♂ (00072800, 00072801), 1 ♀ (00072802) (CNC). Kananaskis Hwy, 50.91555°N 115.14166°W, 25 Jul 1973, L.A. Kelton, 2 ♂ (00072766, 00072767), 1 ♀ (00072768) (CNC). Kananaskis Rd., 50.91555°N 115.14166°W, 20 Jul 1975, L.A. Kelton, *Juniperus communis* (Cupressaceae), 1 ♀

(00072764) *Rosa* sp. (Rosaceae), 3 ♂ (00072231, 00072762–00072763), 1 ♀ (00072765) (CNC). Kananaskis Valley, Pocaterra Creek, 50.91555°N 115.14166°W, 1631 m, 15 Jul 1964, H.B. Leach, 1 ♂ (00077686) (CAS). Lundbreck, 49.58°N 114.17°W, 07 Jul 1970, L.A. Kelton, 2 ♂ (00072232, 00072751) (CNC). Macleod, 49.73333°N 113.4°W, 19 Jun 1952, L.A. Konotopetz, 2 ♂ (00072221, 00072807) (CNC). Medicine Hat, 50.03333°N 110.68333°W, 15 Jun 1930, J.H. Pepper, 2 ♂ (00072212, 00072213) (CNC). Nordegg, 52.46666°N 116.08333°W, 29 Jul 1921, J. McDunnough, 1 ♂ (UASM); 31 Jul 1921, J. McDunnough, 1 ♂ (00072191) (CNC); 19 Jul 1921, J. McDunnough, 1 ♂ (00072185) (CNC); 21 Jul 1921, J. McDunnough, 1 ♂ (00072186) (CNC); 22 Jul 1921, J. McDunnough, 1 ♂ (00072187) (CNC); 23 Jul 1921, J. McDunnough, 1 ♂ (00072188) (CNC); 25 Jul 1921, J. McDunnough, 1 ♂ (00072189) (CNC); 26 Jul 1921, J. McDunnough, 1 ♂ (00072190) (CNC). Red Deer, 52.27024°N 113.80469°W, 856 m, 25 Jun 1957, Brooks and McNay, 10 ♂ (00072192–00072197, 00072703–00072706), 13 ♀ (00072707–00072719) (CNC); 05 Jul 1951, Carr, 1 ♂ (00072775) (CNC). Saint Paul, 53.98333°N 111.28333°W, 21 Jun 1938, E.H. Strickland, 1 ♂ (UASM). Scrub Birch Calling Lake, 55.25°N 113.33333°W, 08 Jul 1949, F.I.S., 1 ♂ (00072239) (CNC). Waterton Park, 49.05°N 113.91666°W, 16 Jun 1952, L.A. Konotopetz, 1 ♂ (00072229) (CNC); 04 Jul 1970–06 Jul 1970, L.A. Kelton, 13 ♂ (00072230, 00072738–00072749), 1 ♀ (00072750) (CNC). Willow Wandering R., 07 Jul 1949, F.I.S., 1 ♂ (00072237) (CNC). **British Columbia:** Canim Lake, 51.85°N 120.75°W, 23 Jun 1938, G.S. Walley, 3 ♂ (00072695–00072696, 00072700) (CNC). Cowichan Bay, 48.75°N 123.6°W, 13 Jul 1959, L.A. Kelton, 1 ♀ (00072701) (CNC). Jesmond, 51.25°N 121.95°W, 16 Jul 1938, J.K. Jacob, 1 ♂ (00072698) (CNC); 18 Jul 1938, J.K. Jacob, 1 ♂ (00072699) (CNC). Williams Lake, 52.11666°N 122.15°W, 13 Jul 1938, G.S. Walley, 1 ♂ (00072697) (CNC). **Manitoba:** 30 mi N of Roblin, 51.66703°N 101.35°W, 14 Jul 1954, Brooks and Wallis, 1 ♂ (00096700) (AMNH). 5 ♂ (00072204–00072205, 00072795–00072797), 2 ♀ (00072798, 00072799) (CNC). 5 km N of Spirit Sands, Spruce Wood Provincial Park, 15 km S of Carberry, 49.71498°N 99.28301°W, 360 m, 08 Jul 1990, M.D. Schwartz, 1 ♂ (00072573) *Rosa* sp. (Rosaceae), 1 ♂ (00072572), 1 ♀ (00072574) (CNC). 5 mi SW of Shilo, 49.74888°N 99.71243°W, 04 Jul 1958, C.D.F. Miller, 1 ♂ (00072211) (CNC). Aweme, 49.72°N 99.6°W, 15 Jul 1920, H.A. Robertson, 1 ♂ (00072224) (CNC); 13 Jun 1922, R.M. White, 1 ♂ (00072238) (CNC). Carberry, 49.86666°N 99.35°W, 29 Jul 1953, Brooks and Kelton, 1 ♂ (00072223) (CNC); 23 Jun 1953, Brooks and Kelton, 3 ♂ (00072171–00072172, 00072178) (CNC); 19 Jun 1953, Brooks and Kelton, 1 ♂ (00072173) (CNC); 16 Jun 1953, Brooks and Kelton, 1 ♂ (00072736), 1 ♀ (00072737) (CNC). Falcon Lake, 49.7°N 95.25°W, 26 Jun 1972, L.A. Kelton, 2 ♂ (00072759, 00072760), 1 ♀ (00123169) (CNC); 01 Jul 1972, L.A. Kelton, *Kalmia* sp. (Ericaceae), 2 ♂ (00123155, 00123156) (CNC); 14 Aug 1972, L.A. Kelton, 1 ♀ (00123170) (CNC). Faloma, 49.71666°N 95.25°W, 28 Jun 1972, L.A. Kelton, 3 ♂ (00072752–00072754) (CNC). Gillam, 56.35°N 94.7°W, 19 Jul 1950, J.F. McAlpine, 2 ♂ (00072201, 00072202) (CNC); 25 Jul 1950, J.F. McAlpine, 1 ♂ (00072203) (CNC). Goodlands, 49.1°N 100.6°W, 12 Jun 1931, R.H. Handford, 2 ♂ (00072786, 00072787) (CNC). Horton, 49.16666°N 100.05°W, 25 Jul 1953, Brooks and Kelton, 1 ♂ (00072071) (CNC). Ninette, 49.4°N 99.63333°W, 11 Jun 1958, C.D.F. Miller, 3 ♂ (00072182–00072184) (CNC); 12 Jun 1958, R.B. Madge, 1 ♂ (00072729) (CNC); 07 Jun 1958, C.D.F. Miller, 4 ♂ (00072730–00072733) (CNC); 11 Jun 1958, R.B. Madge, 1 ♂ (00072734) (CNC); 28 Jul 1958, J.G. Chillcott, 1 ♀ (00072735) (CNC); 20 Jun 1958, R.B. Madge, 1 ♂ (00072776) (CNC); 20 Jun 1958, S. Radinovsky, 1 ♂ (00096006) (AMNH). Souris, 49.61666°N 100.25°W, 22 Jul 1953, A.R. Brooks, 2 ♂ (00072219, 00072220) (CNC). Treesbank, 49.63°N 99.62°W, 20 Jul 1928, R.H. Handford, 1 ♂ (00072810) (CNC). Turtle Mountain, 49°N 100.33333°W, 17 Jul 1953, Brooks and Kelton, 1 ♂ (00072235) (CNC); 18 Jul 1953, Brooks and Kelton, 1 ♂ (00072808) (CNC). Virden, 49.85°N 100.93333°W, 08 Jul 1953, Brooks and Kelton, 4 ♂ (00072166, 00072777–00072779) (CNC); 10 Jul 1953, Brooks and Kelton, 3 ♂ (00072161–00072163) (CNC); 12 Jul 1953, Brooks and Kelton, 1 ♂ (00072164) (CNC); 13 Jul 1953, Brooks and Kelton, 1 ♂ (00072208) (CNC); 14 Jul 1953, Brooks and Kelton, 2 ♂ (00072165, 00072780) (CNC). Winnipeg,

49.88333°N 97.16666°W, unknown, 1 ♂ (00072240) (CNC). **New Brunswick:** Chatham, 47.03333°N 65.43333°W, 27 Jun 1966, L.A. Kelton, 3 ♂ (00072811–00072813) (CNC). Kouchibouguac National Park, 46.87°N 64.98°W, 20 Jul 1977, D.J. Brown, 1 ♀ (00072867) (CNC); 28 Jul 1977, D.J. Brown, *Salix* sp. (Salicaceae), 1 ♂ (00121399) (CNC). Petersville, 45.5°N 66.42°W, 05 Jul 1966, L.A. Kelton, 4 ♂ (00072814–00072817), 1 ♀ (00072818) (CNC). Tabusintac, 47.33305°N 65.01666°W, 20 Jul 1939, J. McDunnough, 1 ♂ (00072820) (CNC); 02 Aug 1939, J. McDunnough, 2 ♂ (00072822, 00072823) (CNC). **Northwest Territories:** Norman Wells, 65.28195°N 123.83104°W, 22 m, 09 Jul 1949, W.R.M. Mason, 1 ♂ (00072694) (CNC). **Ontario:** Lennox and Addington County, 44.91666°N 77.26666°W, 16 Jul 1941, J.F. Brimley, 1 ♂ (00072849) (CNC). Hastings County, 44.50833°N 77.475°W, 19 Jun 1938, J.F. Brimley, 3 ♂ (00072850, 00072852–00072853) (CNC). One Sided Lake, 49.05°N 93.91666°W, 27 Jun 1980, Kelton and Whitney, 1 ♂ (00072864), 2 ♀ (00072865, 00072866) (CNC); 16 Jun 1960–17 Jun 1960, Kelton and Whitney, 6 ♂ (00072858–00072863) (CNC). Pautois Creek on Hwy 17, 3 km E of rt 630, 46.28298°N 78.91512°W, 01 Jul 1990, M.D. Schwartz, *Comptonia asplenifolia* (L.) Fern. (Myricaceae), 3 ♀ (00072580–00072582) (CNC). Petawawa, 45.9°N 77.28333°W, 17 Jun 1980, L. LeSage, *Comptonia peregrina* (L.) Coulter (Myricaceae), 5 ♂ (00072854–00072857, 00121398) (CNC). Renfrew Co., 45.46666°N 76.68333°W, 02 Jul 1951, J.F. Brimley, 1 ♂ (00072851) (CNC). Wawa, 48°N 84.78333°W, 07 Jul 1961, G. Brumpton, 1 ♂ (00072847) (CNC). **Quebec:** Fabre, 47.2°N 79.36666°W, 05 Jul 1963, L.A. Kelton, 1 ♂ (00072838), 2 ♀ (00072251, 00072839) (CNC). Laniel, 47.03333°N 79.26666°W, 06 Jul 1963, L.A. Kelton, 1 ♂ (00072846) (CNC); 26 Jun 1963–27 Jun 1963, L.A. Kelton, 3 ♂ (00072840–00072842), 2 ♀ (00072250, 00072843) (CNC); 10 Jul 1963–11 Jul 1963, W. Gagne, 6 ♂ (00072824–00072829), 1 ♀ (00072830) (CNC). 1 ♂ (00079642) (UCB); 10 Jul 1963–11 Jul 1963, L.A. Kelton, 1 ♂ (00072831) (CNC); 26 Jun 1963–27 Jun 1963, W. Gagne, 2 ♂ (00072832, 00072833), 2 ♀ (00072834, 00072835) (CNC); 16 Jul 1963–17 Jul 1963, W. Gagne, 1 ♂ (00072836), 1 ♀ (00072837) (CNC); 01 Jul 1963–03 Jul 1963, W. Gagne, 1 ♂ (00072844) (CNC); 03 Jul 1963–04 Jul 1963, L.A. Kelton, 1 ♂ (00072845) (CNC); 29 Jun 1963, W. Gagne, 1 ♂ (00123157) (CNC). Mount Albert, 3100 ft, 48.91666°N 66.2°W, 945 m, 18 Jul 1933, W.J. Brown, 1 ♂ (00072848) (CNC). **Saskatchewan:** 186 km N of Regina on Rt 11, 3.3 km E of 11, 52.11983°N 104.61666°W, 10 Jul 1990, M.D. Schwartz, (Fabaceae), 1 ♀ (00072586) (CNC). 45.8 km N of Stoughton on Rt 47, 50.0945°N 103.01666°W, 09 Jul 1990, M.D. Schwartz, *Symphoricarpos occidentalis* Hook. (Caprifoliaceae), 1 ♂ (00072575), 4 ♀ (00072576–00072579) (CNC). Amsterdam, 51.75°N 102.47°W, 11 Jul 1954, Brooks and Wallis, 3 ♂ (00072782–00072784), 1 ♀ (00072785) (CNC). Attons Lake, Cut Knife, 52.75°N 109.01666°W, 18 Jun 1940, A.R. Brooks, 7 ♂ (00072175–00072177, 00072198–00072200, 00072781) (CNC); 17 Jun 1940, A.R. Brooks, 3 ♂ (00072179–00072181) (CNC). Beaver Creek, 54.58333°N 102.25°W, 1920 m, 01 Jul 1951, A.R. Brooks, 1 ♂ (00072214) (CNC). Big River, 53.83333°N 107.03333°W, 05 Jun 1959, A. and J. Brooks, 1 ♂ (00072228) (CNC). Christopher Lake, 53.56666°N 105.83333°W, 13 Jul 1959, A. and J. Brooks, 1 ♂ (00072216) (CNC). Elbow, 51.11666°N 106.6°W, 20 Jun 1960, A.R. Brooks, 1 ♂ (00072789) (CNC); 17 Jun 1960, A.R. Brooks, 1 ♂ (00072790) (CNC); 12 Aug 1960, A.R. Brooks, 1 ♂ (00072791) (CNC). Good Spirit Lake, 51.55°N 102.66666°W, 10 Jul 1954, A.R. Brooks, Wallis, 1 ♂ (00072794) (CNC). Harris, 51.73°N 107.58°W, 03 Jul 1952, L.A. Konotopetz, 1 ♂ (00072792) (CNC). Kenosee Park, 49.83333°N 102.28333°W, 19 Jul 1958, A. and J. Brooks, 1 ♂ (00072788) (CNC). Lebre, 50.75°N 103.7°W, 05 Jul 1951, A.R. Brooks, 6 ♂ (00072167–00072170, 00072720–00072721), 7 ♀ (00072722–00072728) (CNC). Pike Lake, 51.9°N 106.82°W, 12 Jun 1948, J.R. Vockeroth, 1 ♂ (00072234) (CNC). Saint Victor, 49.43305°N 105.86666°W, 28 Jun 1955, A.R. Brooks, 4 ♂ (00072209–00072210, 00072226, 00123158) (CNC). Saskatoon, 52.13333°N 106.66666°W, 21 Jun 1951, A.R. Brooks, 1 ♂ (00072206) (CNC); 05 Jul 1950, A.R. Brooks, 1 ♂ (00072207) (CNC); 14 Jul 1927, Kenneth M. King, 1 ♂ (00072236) (CNC); 22 Jun 1938, H. McDonald, 1 ♂ (00072702) (CNC); 21 Jun 1949, A.R. Brooks, 1 ♂ (00072793) (CNC). Weyburn, 49.66666°N 103.85°W, 07 Jul 1957, L.A. Konotopetz, 1 ♂ (00072215) (CNC). White Fox,

53.45°N 104.08333°W, 27 Jun 1944, R.W. Salt, 1 ♂ (00072217) (CNC). Willow Bunch, 49.4°N 105.63333°W, 27 Jul 1955, A.R. Brooks, 2 ♀ (00072773, 00072774) (CNC). Willows, 49.6°N 105.85°W, 19 Jun 1955, A.R. Brooks, 2 ♂ (00072761, 00072772) (CNC). [Skiptou] Skipton, 23 Jul 1907, J. Hetcher, 1 ♂ (00072225) (CNC). **USA: Alaska: Fairbanks North Star Co.:** Tok, 63.33667°N 142.98556°W, 22 Jul 1982, L.A. Kelton, 1 ♂ (00072692), 1 ♀ (00072693) (CNC). **Southeast Fairbanks Co.:** Big Delta, 64.1525°N 145.84222°W, 13 Jul 1951, W.R.M. Mason, 1 ♂ (00072691) (CNC). **California: Siskiyou Co.:** 10 mi NE of Weed, junction of Rts 97 and A12, 41.525°N 122.24845°W, 1158 m, 21 Jun 1981, J.D. Lattin, 1 ♂ (00076082) (ORSU). **Colorado: Boulder Co.:** Boulder, 40.015°N 105.27°W, 1676 m, 22 Jun 1922, L.O. Jackson, 1 ♂ (00068917) (USNM). Nederland, Roosevelt National Forest, 39.96139°N 105.51028°W, 29 Jun 1961, J.R. Stainer, 2 ♂ (00072676, 00072677) (CNC). Unknown, 22 Jun 1935, R.H. Beamer, 1 ♂ (00096003) (AMNH); 08 Jul 1949, L.D. Beamer, 1 ♂ (00074916) (KU). **Clear Creek Co.:** Chicago Creek, 39.73999°N 105.52125°W, 2682 m, 05 Aug 1961, B.H. Poole, 1 ♂ (00072588) (CNC). Mount Goliath Natural Area, 39.63833°N 105.59444°W, 3414 m, 21 Aug 1986, R.T. Schuh and J.T. Polhemus, *Potentilla fruticosa* L. (Rosaceae), 1 ♂ (00096698) (AMNH); 21 Aug 1982, D.A. and J.T. Polhemus, 1 ♂ (00092756) (TAMU); 08 Aug 1983, D.A. and J.T. Polhemus, 2 ♂ (00092754, 00092755) (TAMU). Squaw Pass Road, 39.67917°N 105.47306°W, 11 Aug 1984, J.T. and D.A. Polhemus, 1 ♀ (00063768) (JTP). **Denver Co.:** Denver, 39.73917°N 104.98417°W, 20 Jun 1969, J.T. Polhemus, 1 ♂ (00092750) (TAMU). **Douglas Co.:** Perry Park, 39.25667°N 104.99194°W, 15 Jul 1983, J.T. Polhemus, 2 ♂ (00063698, 00063699), 3 ♀ (00063700–00063702) (JTP); 08 Jul 1982, J.T. Polhemus, 1 ♀ (00063744) (JTP). Waterton, 39.49361°N 105.08806°W, 07 Jul 1983, D.A. Polhemus, 1 ♂ (00063703) (JTP); 29 Jun 1983, D.A. Polhemus, 13 ♂ (00063715–00063727), 4 ♀ (00063704–00063705, 00063728–00063729) (JTP); 12 Jul 1982, D.A. Polhemus, 1 ♂ (00063736) (JTP); 23 Jun 1983, D.A. Polhemus, 3 ♂ (00063737–00063739) (JTP); 15 Jul 1982, D.A. Polhemus, 1 ♀ (00063743) (JTP). **Eagle Co.:** N of Minturn, Grouse Creek Trail, 39.59582°N 106.43305°W, 2390 m, 11 Aug 1986, J.T. and D.A. Polhemus, 5 ♂ (00063482–00063486) (JTP); 26 Jun 1988, J.T. and D.A. Polhemus, 4 ♂ (00063686–00063689), 3 ♀ (00063690–00063692) (JTP). Vail, 39.64028°N 106.37361°W, 2591 m, 23 Jun 1986, J.T. Polhemus, 1 ♂ (00063755) (JTP); 27 Jun 1978, J.T. Polhemus, 1 ♂ (00063742) (JTP); 22 Jun 1987, J.T. Polhemus, 1 ♂ (00063754) (JTP). **El Paso Co.:** 7 mi SW Colorado Springs, 38.76209°N 104.91294°W, 15 Jun 1980, J.T. and D.A. Polhemus, 1 ♂ (00063740) (JTP). Palmer Lake, 39.12222°N 104.91667°W, 13 Jul 1901, unknown, 1 ♂ (00068972) (USNM). **Fremont Co.:** 4 miles W of Coaldale, 38.36554°N 105.83118°W, 19 Jun 1988, R. Wharton, 1 ♂ (00092747) (TAMU). 5 mi S Coaldale, 38.29307°N 105.75722°W, 2225 m, 08 Jul 1970, D. Brothers & C. Michener, 1 ♂ (00074918) (KU). **Gilpin Co.:** 5 mi S of Nederland, 39.88892°N 105.51028°W, 02 Jul 1961, J.G. Chillcott, 2 ♂ (00072682, 00072683), 2 ♀ (00072684, 00072685) (CNC). Rollinsville, Roosevelt National Forest, 39.91722°N 105.50056°W, 01 Aug 1968, L.A. Kelton, *Potentilla* sp. (Rosaceae), 1 ♂ (00072689), 1 ♀ (00072690) (CNC). Roosevelt National Forest Campground, 3 km S Nederland, 39.92994°N 105.50261°W, 2600 m, 12 Jul 1993, B. Landry, 1 ♂ (00072675) (CNC). **Gunnison Co.:** Almont, 38.66444°N 106.84611°W, 2743 m, 03 Jul 1925, unknown, 1 ♂ (00068949) (USNM). **Jackson Co.:** 2 mi E of Gould, 40.52639°N 105.98807°W, 05 Aug 1975, J.C. Schaffner, 2 ♀ (00092947, 00092948) (TAMU). Rabbit Ears Pass, 40.38472°N 106.61111°W, 2896 m, 07 Jul 1961, J.G. Chillcott, 2 ♂ (00072678, 00072679) (CNC). **Jefferson Co.:** North Turkey Creek Park, 39.59468°N 105.22014°W, 15 Jul 1983, D.A. and J.T. Polhemus, *Symphoricarpos* sp. (Caprifoliaceae), 2 ♂ (00063750, 00063751), 2 ♀ (00063752, 00063753) (JTP). North Turkey Creek Park near Tenders, 39.59468°N 105.22014°W, 1890 m, 16 Jul 1983, R.T. Schuh, D.A. and J.T. Polhemus, *Symphoricarpos oreophilus* A. Gray (Caprifoliaceae), 2 ♂ (00059685, 00059686), 1 ♀ (00059687) (AMNH). Red Rocks Park, 39.66972°N 105.20278°W, 07 Jul 1983, D.A. Polhemus, 2 ♂ (00063693, 00063694), 3 ♀ (00063695–00063697) (JTP); 23 Jun 1982, D.A. Polhemus, 2 ♂ (00063731, 00063732), 3 ♀ (00063733–00063735) (JTP). Red Rocks Park near Morrison, 39.65361°N 105.19056°W, 1707 m, 15 Jul 1983, R.T. Schuh and D.A. Polhemus, *Symphoricarpos oreophilus*

A. Gray (Caprifoliaceae), 2 ♂ (00096695, 00096696) (AMNH). **La Plata Co.:** Durango, Junction Creek Road, 37.28763°N 107.87562°W, 09 Jul 1968, E.C. Becker, 1 ♂ (00072589) (CNC). **Larimer Co.:** 40 mi W Fort Collins, Bennett Crk. Picnic Ground, Pingree Pk. Rd., 40.58°N 105.847°W, 2256 m, 14 Jul 1986, R.T. Schuh and J.T. Polhemus, 1 ♂ (00096027) (AMNH). Cascade Lodge, Rocky Mountain National Park, 40.33305°N 105.70888°W, 02 Aug 1931, H.C. Severin, 1 ♂ (00068946) (USNM). Chambers Lake, Roosevelt National Forest, 40.68333°N 105.55°W, 2804 m, 11 Aug 1968, L.A. Kelton, 1 ♂ (00072680), 1 ♀ (00072681) (CNC). Estes Park, 40.39361°N 105.49417°W, 2286 m, 02 Jul 1961, W.R.M. Mason, 1 ♂ (00072587) (CNC). Fall River Pass, 40.44027°N 105.75472°W, 488 m, 12 Aug 1948, H.G. & D. Townes, 1 ♂ (00068936) (USNM). Fish Creek P.G., Pingree Park road, 40.59299°N 105.59154°W, 14 Jul 1986, J.T. and D.A. Polhemus, 1 ♂ (00063745), 1 ♀ (00063746) (JTP). Fish Crk. Picnic Grd., Pingree Pk. Rd. 46 mi W Fort Collins, 40.58195°N 105.96172°W, 2347 m, 14 Jul 1986, R.T. Schuh and J.T. Polhemus, 3 ♂ (00096023–00096025), 2 ♀ (00096891, 00096892) *Ribes* sp. (Grossulariaceae), 1 ♂ (00059684), 2 ♀ (00059688, 00059689) (AMNH). Fort Collins, 40.58528°N 105.08389°W, 29 Jun 1900, unknown, 1 ♂ (00068986) (USNM); 12 Jun 1900, unknown, 3 ♂ (00068960, 00068987–00068988) (USNM); 17 Jun 1899, unknown, 11 ♂ (00068955, 00068957–00068958, 00068961–00068965, 00068967–00068969) (USNM); 21 Jul 1898, unknown, 1 ♂ (00068956) (USNM); 14 Jul 1898, unknown, 1 ♂ (00068959) (USNM); 28 Jun 1900, unknown, 1 ♂ (00068966) (USNM). Fort Collins, 40.58528°N 105.08389°W, 09 Jul 1902, unknown, 1 ♂ (00069320) (USNM); 23 Jun 1935, R.H. Beamer, 1 ♂ (00074944) (KU); 08 Jul 1898, unknown, 1 ♂ (00068921) (USNM); 12 Jun 1909, unknown, 1 ♀ (00068947) (USNM); 28 Jun 1900, unknown, 1 ♀ (00068918) (USNM); 17 Jun 1899, unknown, 1 ♂ (00096921) (AMNH). Pingree Park, 40.56111°N 105.59722°W, 11 Jul 1937, R.H. Beamer, 1 ♂ (00074915) (KU). Pingree Park road at jct. w. Colo. 14, 40.56111°N 105.59722°W, 14 Jul 1986, J.T. and D.A. Polhemus, 2 ♂ (00063747, 00063748), 1 ♀ (00063749) (JTP). Rist Canyon, 40.63388°N 105.19972°W, 13 Jul 1898, unknown, 1 ♂ (00069327) (USNM). **Las Animas Co.:** S side of Cuchara Pass on Rt. 12, 2835 m, 19 Aug 1986, R.T. Schuh and J.T. Polhemus, *Cercocarpus montanus* Raf. (Rosaceae), 1 ♂ (00096026), 1 ♀ (00096710) (AMNH). **Mineral Co.:** Creede, 37.84917°N 106.92583°W, 21 Jun 1990–23 Jun 1990, J.T. and D.A. Polhemus, 9 ♂ (00063756–00063764), 3 ♀ (00063765–00063767) (JTP). Creede, 37.84888°N 106.92638°W, 06 Jul 1937, R.H. Beamer, 1 ♂ (00074920) (KU). **Ouray Co.:** Ouray, 38.02278°N 107.67083°W, 2591 m, 11 Jul 1919, unknown, 1 ♂ (00096017), 1 ♀ (00096890) (AMNH). **Park Co.:** 3 mi S of Guffey, 38.70773°N 105.52083°W, 30 Jul 1983, D.A. and J.T. Polhemus, 2 ♂ (00063710, 00063711), 1 ♀ (00063712) (JTP). **Routt Co.:** Clark, 2438 m, 03 Aug 1947, Bryant, 1 ♂ (00096001) (AMNH). Steamboat Springs, 40.485°N 106.83111°W, 2134 m, 01 Sep 1943, O.B., 1 ♂ (00074919) (KU); 24 Jul 1983, J.T. and D.A. Polhemus, 1 ♀ (00063706) (JTP). **San Juan Co.:** Weminuche Wilderness, San Juan National Forest, 37.46666°N 106.97888°W, 3527 m, 04 Aug 1984, C.B. Barr, 1 ♂ (00079641) (UCB). near Ophir, 37.85694°N 107.83194°W, 2591 m, 07 Jul 1980, J.T. Polhemus, 1 ♂ (00063741) (JTP). **Summit Co.:** Shrine Pass Rest Area on I-70, 39.54694°N 106.24222°W, 3353 m, 25 Jul 1984, G. & J. Stonedahl, 1 ♂ (00096007) *Salix* sp. (Salicaceae), 3 ♂ (00096005, 00096022, 00096699), 2 ♀ (00096708, 00096709) (AMNH). Electra Lake, 37.55°N 107.8°W, 2560 m, 28 Jun 1919–01 Jul 1919, unknown, 1 ♂ (00096018) (AMNH). Little Beaver, 16 Jul 1898, unknown, 1 ♂ (00096002) (AMNH). 1 ♂ (00068931) (USNM); 20 Jul 1898, unknown, 1 ♀ (00068920) (USNM). Little Beaver Creek, 37.13222°N 106.68694°W, 11 Jul 1937, C.L. Johnston, 1 ♂ (00074917) (KU). Unknown, 4 ♂ (00068916, 00068953, 00068976, 00069324) (USNM). **Idaho: Valley Co.:** Warm Lake, 44.65292°N 115.66707°W, 08 Aug 1962, M.M. Furniss, 1 ♂ (00068950) (USNM). **Maine: Cumberland Co.:** Unknown, Cumberland County, 43.85°N 70.33333°W, 15 Jul 1916, A. Nicolay, 1 ♂ (00068924) (USNM). **Hancock Co.:** Bar Harbor, 44.39583°N 68.19389°W, 6 m, unknown, 1 ♂ (00068973) (USNM); 23 Jun 1936, A.E. Brower, 1 ♂ (00068922) (USNM); 24 Jun 1934, unknown, 2 ♂ (00068926, 00068945) (USNM). **Oxford Co.:** Paris, 44.25972°N 70.50055°W, 246 m, 07 Jun 1931, C.A. Frost, 1 ♂ (00068938) (USNM). **Washing-**

**ton Co.:** Machias, 44.715°N 67.46111°W, 26 m, 26 Jul 1904, unknown, 1 ♂ (00077692) (CAS). **York Co.:** Waterboro Barrens, 43.56717°N 70.77669°W, 19 Jun 1995, T. Parron, 1 ♂ (00068923) (USNM). **Massachusetts: Barnstable Co.:** Provincetown, 42.05833°N 70.17861°W, 11 m, 28 Jun 1891, unknown, 1 ♂ (00077693) (CAS). Woods Hole, 41.5265°N 70.67309°W, 3 m, 02 Jul 1905, unknown, 1 ♂ (00077690) (CAS); 06 Jul 1925, E.D. Ball, 1 ♂ (00096920) (AMNH). **Bristol Co.:** North Attleboro, 41.98333°N 71.33277°W, 57 m, 20 Jun 1920, C.A. Frost, 1 ♂ (00077722) (CAS). **Dukes Co.:** Marthas Vineyard, 41.33333°N 70.61611°W, 24 m, 26 Jun 1972, C.T. Parsons, 1 ♂ (00096020) (AMNH). **Essex Co.:** Marblehead, 42.5°N 70.85777°W, 20 m, 23 Jul 1921, F.H. Walker, 1 ♂ (00077689) (CAS). **Hampden Co.:** West Springfield, 42.10694°N 72.62027°W, 22 m, 12 Jun 1896, Knab, 1 ♂ (00069326) (USNM). **Middlesex Co.:** Sherborn, 42.23888°N 71.36972°W, 61 m, 08 Jun 1919, C.A. Frost, 1 ♂ (00077691) (CAS). **Plymouth Co.:** Manomet, 41.91861°N 70.56611°W, 6 m, 16 Jun 1912, unknown, 1 ♂ (00077687) (CAS). **Worcester Co.:** Berlin, 42.38111°N 71.6375°W, 13 Jun 1915, C.A. Frost, 1 ♂ (00077432) (CAS). **Michigan: Crawford Co.:** Crawford county, No specific locality, 44.66°N 84.6°W, 01 Jul 1939, D.S. Bullock & R.R. Dreisbach, 1 ♂ (00069325) (USNM). **Delta Co.:** Delta County, No specific locality, 45.9°N 86.91°W, 04 Jul 1940, unknown, 1 ♂ (00086411) (MSU). **Kalkaska Co.:** *Orectoderus nitidulus*: Kalkaska County [44.66667°N 85.10005°W] 23 Jun 1951, R.R. Dreisbach (00127336) (MSU). **Presque Isle Co.:** T33N R2E S.33, 45.3°N 83.78°W, 19 Jun 1968, N. & T. Baker, 1 ♂ (00086576) (MSU). **Minnesota: Hubbard Co.:** 9 mi S of Lake George on Rt 3, 47.10294°N 94.98039°W, 475 m, 22 Jun 1995, T.J. Henry and A.G. Wheeler, Jr., 6 ♂ (00177724–00177729), 4 ♀ (00177730–00177733) (USNM). **St. Louis Co.:** 6 mi NNW of Cook on Rt 53, 47.90012°N 92.78453°W, 411 m, 26 Jun 1995, T.J. Henry and A.G. Wheeler, Jr., *Aster macrophylla* (Asteraceae), 9 ♂ (00177741–00177749), 7 ♀ (00177750–00177756) (USNM). **Montana: Carbon Co.:** E Rosebud Canyon, 46.27472°N 106.44167°W, 1646 m, 11 Jul 1963, B. Vogel, 1 ♂ (00063707) (JTP). **Dawson Co.:** Glendive, 47.10639°N 104.71028°W, 21 Jun 1956, R.C. Froeschner, 1 ♂ (00068994) (USNM). **Gallatin Co.:** Bozeman, 45.67972°N 111.03778°W, 08 Jul 1928, unknown, 3 ♂ (00068990–00068992) (USNM); 30 Jul 1928, unknown, 1 ♂ (00068993) (USNM). **Hill Co.:** Simpson, 48.92861°N 110.20583°W, 847 m, 19 Jun 1959, A.R. Gittins, *Lupinus* sp. (Fabaceae), 1 ♂ (00086612) (UID). **Park Co.:** Eagle Creek road, 3 miles NE of Gardiner, 45.06°N 110.67°W, 1890 m, 21 Jul 1964, H.B. Leech, 2 ♂ (00077685, 00077723) (CAS). **Stillwater Co.:** Mystic Lake, 45.86778°N 113.54972°W, 24 Jul 1902, unknown, 1 ♂ (00092746) (TAMU). 2 ♂ (00068809, 00068937) (USNM). **Nebraska: Sheridan Co.:** Hay Springs, 42.68389°N 102.68944°W, 28 Jun 1973, L.A. Kelton, *Symphoricarpos* sp. (Caprifoliaceae), 1 ♂ (00072674), 2 ♀ (00072686, 00072687) (CNC). **Sioux Co.:** Monroe Canyon, 42.76611°N 103.92611°W, 1364 m, 22 Jun 1911, F.H. Shoemaker, 1 ♂ (00082778) (UCR). **New Hampshire: Coos Co.:** Mount Washington, 43.17583°N 72.09722°W, 14 Aug 1958, J.R. Vockeroth, 1 ♂ (00072227) (CNC). **New Mexico: Colfax Co.:** 5 miles W Ute Pk, Cimarron Canyon, 36.55833°N 105.12111°W, 2269 m, 25 Jun 1954, H.R. Burke, 2 ♂ (00092752, 00092753), 1 ♀ (00092946) (TAMU). **San Miguel Co.:** Beulah, 35.36444°N 105.45028°W, 1831 m, 15 Jul 1927, unknown, 1 ♂ (00068948) (USNM). **Santa Fe Co.:** 7 mi E of Tesuque, 35.7616°N 105.80681°W, 06 Jul 1982, D.A. and J.T. Polhemus, 1 ♂ (00063730) (JTP). Tesuque, 35.76166°N 105.9325°W, 15 Jul 1932, unknown, 6 ♂ (00068930, 00068971, 00068974, 00069321–00069323) (USNM); 25 Jul 1932, unknown, 1 ♂ (00068977) (USNM). **Taos Co.:** Columbine Park Recreation Area, 36.73511°N 105.46052°W, 24 Jul 1968, J.C. Schaffner, 1 ♂ (00092748) (TAMU). Taos Canyon, 36.40722°N 105.57305°W, 14 Jun 1956, R. & K. Dreisbach, 1 ♂ (00068980) (USNM). Tres Ritos, 36.13056°N 105.51528°W, 25 Jul 1968, J.C. Schaffner, 2 ♂ (00092749, 00092751) (TAMU). **New York: Suffolk Co.:** Bayshore, Long Island, 40.725°N 73.24527°W, 5 m, 04 Jul 1915–07 Jul 1915, Chris. E. Olsen, 1 ♂ (00068929), 2 ♀ (00068939, 00069369) (USNM); 18 Jul 1949, Roy Latham, 1 ♂ (00068934) (USNM). Half Way Hollow Hills, Long Island, 40.78°N 73.37°W, 02 Jul 1915, Wm. T. Davis, 1 ♂ (00068954) (USNM). Montauk, Long Island, 41.03583°N 71.95444°W, 11 m, 02 Jul 1916, F.M. Schott, 1 ♂ (00068942) (USNM). **North Dakota:**

**Morton Co.:** Mandan, 46.8266°N 100.8895°W, 20 Jun 1937, A.B. Gurney, 1 ♂ (00068940) (USNM). **Oregon: Klamath Co.:** Crater Lake National Park, 42.94167°N 122.15°W, 07 Aug 1963, Schuh, Hansen, Miller, 1 ♂ (00096009), 1 ♂ (00096008) (AMNH); 03 Aug 1968, Joe Schuh, 2 ♂ (00096010, 00096011) (AMNH); 01 Aug 1962, Vertrees & Schuh, 4 ♂ (00096012–00096014, 00096016) (AMNH); 16 Aug 1962, Vertrees & Schuh, 1 ♂ (00096015) (AMNH). **Lane Co.:** H.J. Andrews Experimental Forest, 0.5 mi N of Fissel Point, T15S R6E Sec 29 SE¼, 44.2325°N 122.1167°W, 1478 m, 30 Jul 1980, unknown, 1 ♂ (00063708), 1 ♀ (00063709) (JTP). **Linn Co.:** HJ Andrews Experimental Forest, 1 mile from Road 350 end, Ridge Site, 44.2325°N 122.1167°W, 16 Jul 1985, Stonedahl & McIver, *Lupinus* sp. (Fabaceae), 7 ♂ (00095994–00095999, 00096697), 4 ♀ (00096880–00096883) (AMNH). Iron Mountain, 6 mi E Upper Soda, 44.40632°N 122.16003°W, 1524 m, 11 Aug 1962, G.C. Eickwort, 1 ♀ (00063714) (JTP). Monument Peak, 21 Jul 1968, Kenneth Goeden, 1 ♂ (00076120) (ORSU). Tombstone Prairie, 44.39528°N 122.13694°W, 19 Jul 1977, G. Eulenson, 1 ♂ (00063713) (JTP). **South Dakota: Brule Co.:** Chamberlain, 43.81055°N 99.33055°W, 429 m, 13 Jun 1940, G.B. Spawn, 2 ♂ (00068927, 00068935) (USNM). **Buffalo Co.:** Unknown, Buffalo county, 44.05278°N 99.175°W, 20 Jun 1925, unknown, 1 ♂ (00068928) (USNM). **Butte Co.:** Castle Rock, 44.96443°N 103.42435°W, 957 m, 29 Jun 1973, L.A. Kelton, *Artemisia* sp. (Asteraceae), 1 ♀ (00072688) (CNC). **Lawrence Co.:** Black Hills, 44.41667°N 103.70833°W, 29 Jun 1973, L.A. Kelton, 2 ♂ (00072672, 00072673) (CNC); 20 Jul 1928, A.A. Nichol, 2 ♂ (00068970, 00068979) (USNM). Black Hills, 44.41638°N 103.70861°W, 1377 m, 11 Jul 1900, J.L. Webb, 1 ♂ (00068919) (USNM); 20 Jul 1928, A.A. Nichol, 1 ♂ (00096922) (AMNH). 1 ♀ (00068941) (USNM). Deadwood, 44.37638°N 103.72944°W, 1381 m, 29 Jul 1927, H.H. Knight, 1 ♀ (00068944) (USNM). Whitewood, 44.46083°N 103.63833°W, 1114 m, 26 Jun 1923, H.C. Severin, 1 ♂ (00096924) (AMNH). **Utah: Salt Lake Co.:** Parleys Canyon, 40.7119°N 111.798°W, 1524 m, 24 Jun 1922, E.P. Van Duzee, 1 ♂ (00077694) (CAS). **Utah Co.:** Mount Timpanogos, 40.39083°N 111.645°W, 21 Jun 1960, G.F. Knowlton, 1 ♂ (00074458) (UCD). **Wasatch Co.:** 20 miles SE Heber, Daniels Pass, 40.29694°N 111.25194°W, 2437 m, 07 Jun 1969, W.F. Barr, *Artemisia cana* (Asteraceae), 1 ♂ (00086617) (UID). **Wisconsin: Wood Co.:** Griffith Street Nursery, Wood county, 44.45°N 90.05°W, 06 Jul 1947, R.D. Shenefelt, 1 ♂ (00068932) (USNM). **Wyoming: Crook Co.:** Sundance, 44.40639°N 104.37528°W, 30 Jul 1927, H.H. Knight, 1 ♂ (00068925) (USNM). **Park Co.:** Canyon Village, Yellowstone Natl. Park, 44.76667°N 109.465°W, 21 Jul 1971, G.C. Steyskal, 1 ♂ (00068982) (USNM). **Essex Co.:** unknown, 15 Jun 1912, unknown, 1 ♂ (00077688) (CAS). **Unknown Co.:** Clymont, 25 Jun 1936, E.H. Strickland, 1 ♂ (00068978) (USNM). Lot 139, 15 Jun 1924, unknown, 1 ♂ (00077431) (CAS).

## GENUS *PRNOTOCREPIS* KNIGHT

Type species: *Pronotocrepis clavicornis* Knight, 1929: 217 (by monotypy).

*Pronotocrepis* Knight, 1929: 217 (original description); Carvalho, 1952: 65 (catalog), 1955a: 43 (key), 1958: 110 (catalog); Knight, 1969: 79 (key to species); Schuh, 1974: 309 (note); McIver and Stonedahl, 1987a: 258 (note), 1987b: 278 (note).

**DIAGNOSIS:** Recognized by trapezoidal pronotum (fig. 7) with lateral margin explanate; corium with embolium slightly explanate; body shape wide oval; second antennal segment clavate, red-black (fig. 7); third and fourth antennal segments slender; labium long, reaching over metacoxae; pulvilli almost reaching apex of the claws and attached over entire length of pulvillus (fig. 8C); vesica short, curved apically, angled, terminating in flattened roundish apex with serrate margin (figs. 8F, 9). Distinguished from *Orectoderus* and *Teleorhinus* by general aspect (fig. 7), vesica (figs. 8F, 9), and female genitalia (fig. 11).

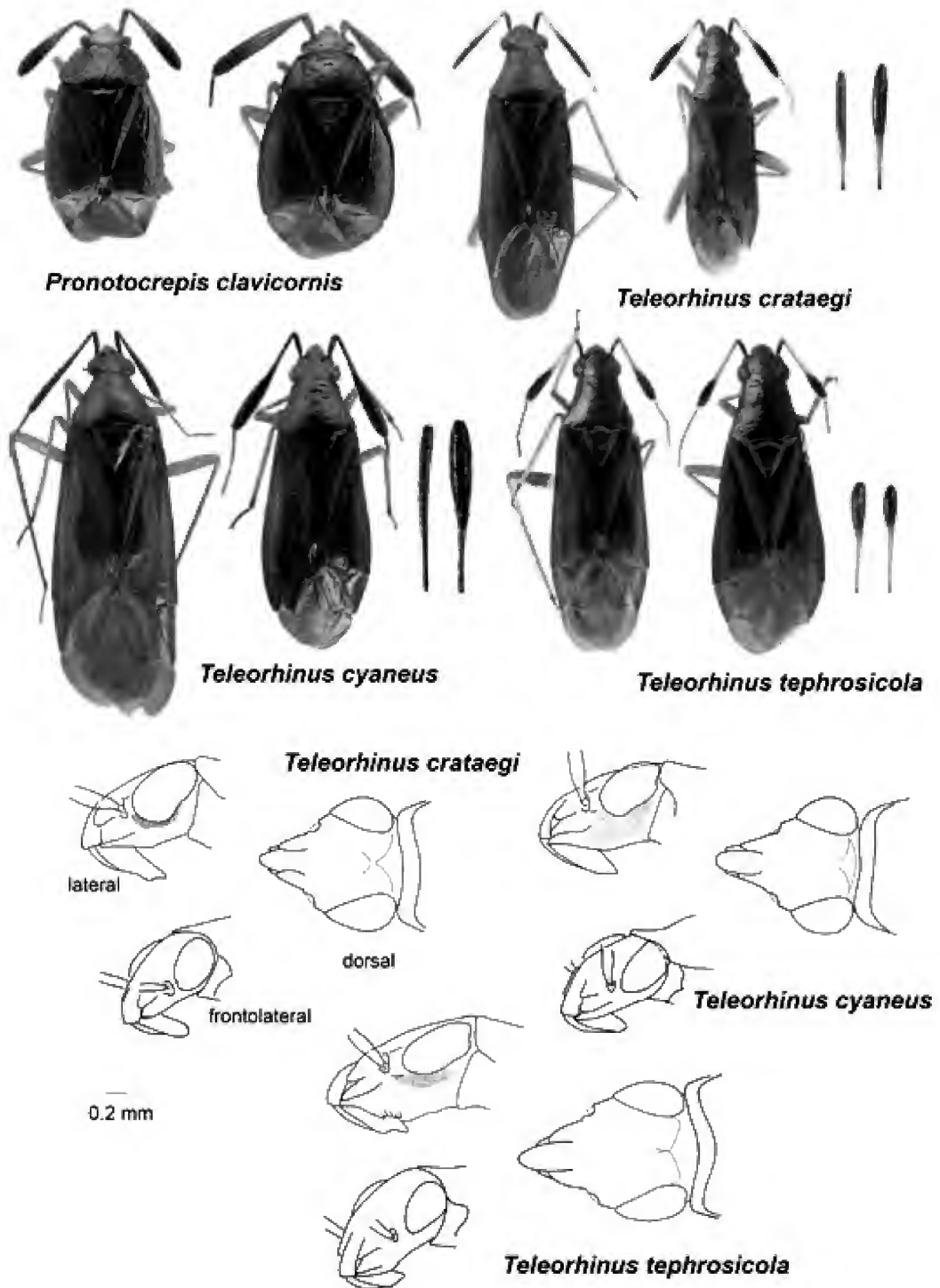


FIGURE 7. Habitus view and antennal segments of *Pronotocrepis clavicornis* and habitus view, antennal segments and head of *Teleorhinus* spp.; antennal segments of males (left) and females (right); habitus view of males (left) and females (right) in dorsal view; head: in lateral, dorsal and frontolateral view.

**REDESCRIPTION:** *Male*: Large, ovate; total length 5.25–5.76, length apex clypeus-cuneus fracture 4.17–4.38, width across pronotum 1.95–2.14. **COLORATION:** Head orange, vertex yellowish orange; labium dark brown with first segment paler; pronotum usually dark brown, calli and distal edge of pronotum sometimes bright yellowish orange; mesoscutum and scutellum brown; pronotum and scutellum in brighter colored specimens with faint yellowish-orange band medially; hemelytra dark brown with embolium brown, orange-red, or yellowish white; cuneus orange-red or yellowish white, apically brown in specimens with bright embolium; cuneus in dark-colored specimens completely brown; membrane including veins brown; first antennal segment bright yellowish orange or dark red, sometimes brown distally; second antennal segment red with distal part brown; third and fourth antennal segments brown; venter dark brown; propleuron red-orange dorsally, brownish ventrally; meso- and metapleuron brown; coxae, trochanter, femora, and tibia yellow; femora sometimes orange, tibia brownish distally; tarsus brown. **SURFACE AND VESTITURE:** General aspect very shiny (fig. 7); pronotum and scutellum rugose; punctation of hemelytra and clavus deep; embolium without punctation; dorsal surface, including antennal segments clothed with reclining black setae (fig. 8D), also gula bearing strong, dark setae; tibia with black spines; claws straight, curved apically; pretarsus with pulvillus connate to claw on its entire length (fig. 8C). **STRUCTURE:** Ovate (fig. 7); first rostral segment overlapping proximal margin of gula (fig. 8A); labium long, overlapping metatrochanter; vertex with yellowish triangular carina medially; pronotum with yellowish carina at distal outer margin. **GENITALIA:** Pygophore moderately large (fig. 8E); vesica simple strap, curved apically, tapering to roundish apex with serrate margin (figs. 8F, 9); vesica widest at level of secondary gonopore; secondary gonopore with expanded denticulate lobe basally; apex of anterior process of left paramere blunt; right paramere elongate ending in pointed apophysis (fig. 9).

*Female*: Total length 5.35–6.11, length apex clypeus-cuneus fracture 4.39–4.52, width across pronotum 2.11–2.15. Coloration, surface, vestiture, and structure as in males; compared to male second antennal segment widened on its entire length. **GENITALIA:** Sclerotized rings of dorsal labiate plate asymmetrical, triangular, straight basally, rounded apically; posterior wall partially sclerotized (fig. 12).

**HOSTS:** *Ribes cereum* and *R. inerme* (Grossulariaceae).

**DISTRIBUTION:** United States and Canada.

**DISCUSSION:** Erected by Knight (1929) as a monotypic genus for his new species *Pronotocrepis clavicornis*. Two additional species, *ribesi* and *ruber*, were later described by Knight (1969).

### *Pronotocrepis clavicornis* Knight

Figures 7, 8, 9, 12; map 4; table 3

*Pronotocrepis clavicornis* Knight, 1929: 217 (new species, description); Carvalho, 1958: 110 (catalog); McIver & Stonedahl, 1993: 354 (fig.); Wyniger et al., 2008: 331 (presence of brochosomes), 335, fig. 4B–G (detail of tarsal segments, detail of pygophore).

*Pronotocrepis ribesi* Knight, 1969: 79 (new species, description, host). NEW SYNONYMY.

*Pronotocrepis ruber* Knight, 1969: 80 (new species, description). NEW SYNONYMY.

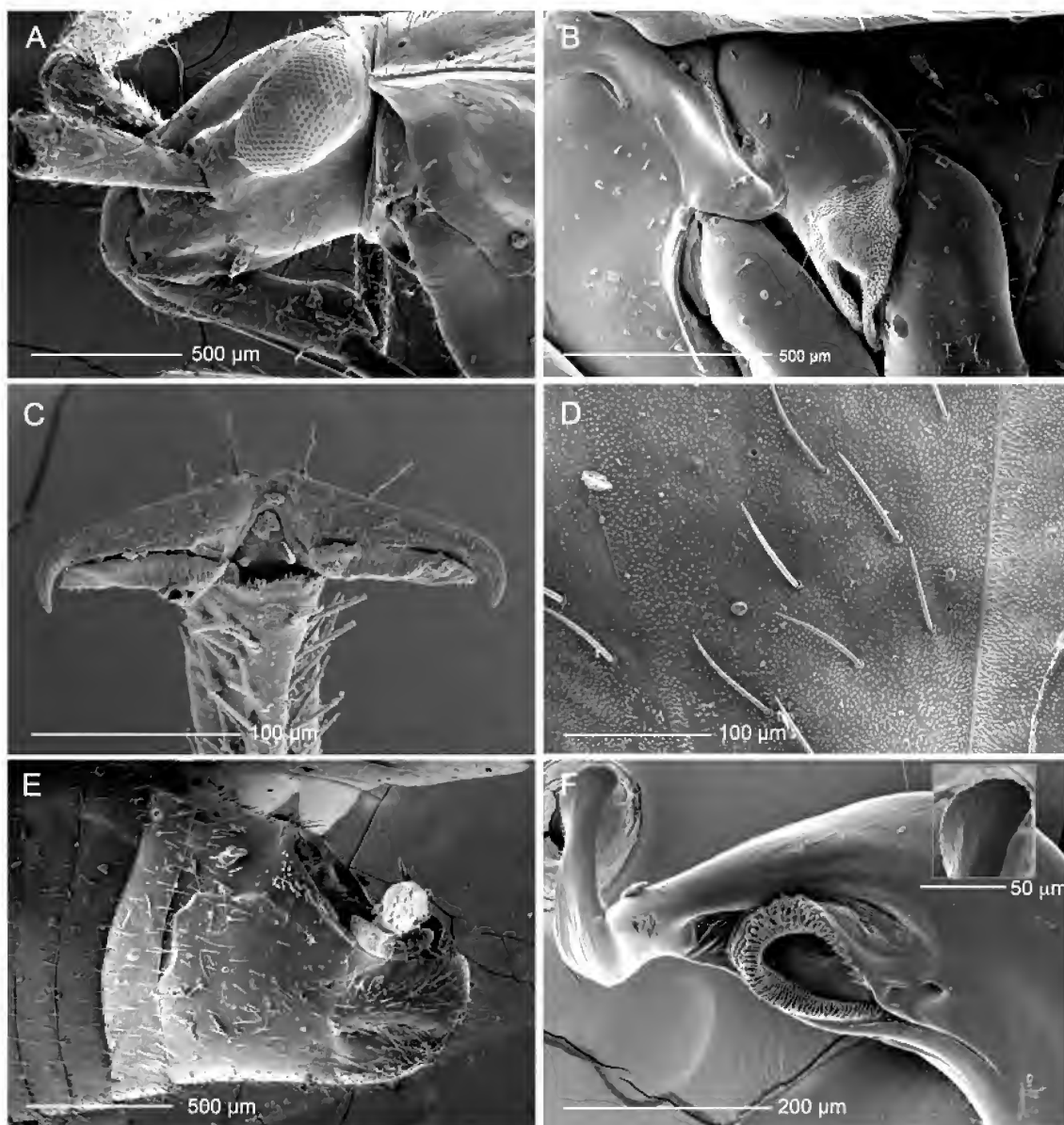


FIGURE 8. Scanning electron micrographs of *Pronotocrepis clavicornis* (male). **A.** Head and thorax (lateral view). **B.** Metathoracic scent-gland evaporatory area (lateral view). **C.** Pretarsus (frontal view). **D.** Setae on hemelytra, detail of microstructure. **E.** Pygophore (lateral view). **F.** Vesica with secondary gonopore (dorso-lateral view), detail of vesica, apex with serrate margin.

TYPE MATERIAL (EXAMINED): *Pronotocrepis clavicornis*: HOLOTYPE: Male: [USA] Colorado [Costilla Co.] Fort Garland, Ute Creek Ranch [37.43274°N 105.43846°W] 11 Aug 1925, H.H. Knight (AMNH\_PBI 00069005) (USNM).

*Pronotocrepis ribesi*: HOLOTYPE: Male: [USA] Washington [Yakima Co.] Tieton Canyon [46.65217°N 120.7248°W] 21 Jun 1932, A.R. Rolfs (AMNH\_PBI 00069004) (USNM). PARATYPE: [USA] Washington [Yakima Co.] Tieton Canyon [46.65217°N 120.7248°W] 21 Jun 1932, A.R. Rolfs, 1 ♀ (00068792) (USNM).

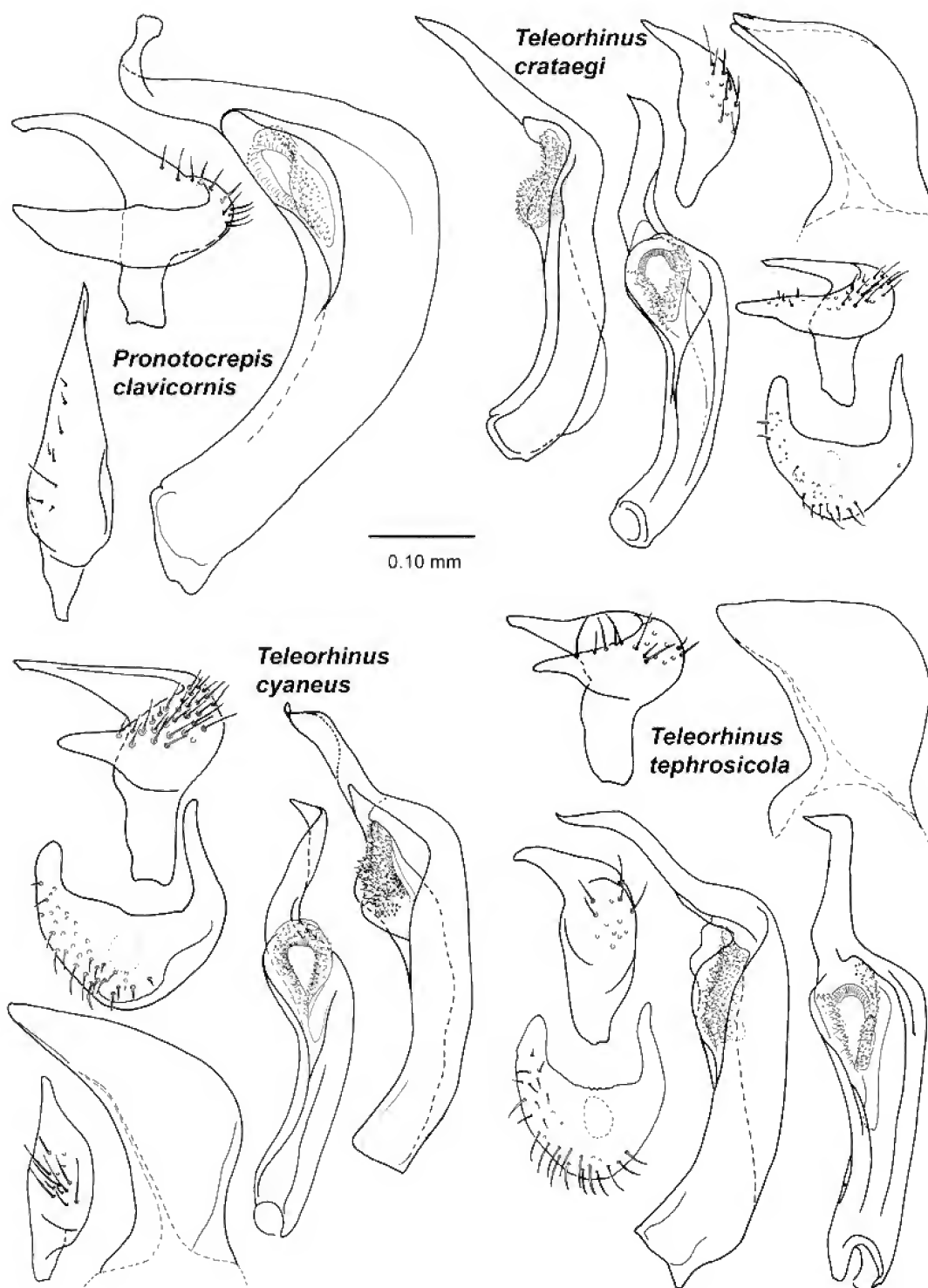


FIGURE 9. Male genitalia of *Pronotocrepis clavicornis* and *Teleorhinus* spp.; vesica (lateral view), phallosome (lateral view), right paramere.

TABLE 3. Measurements of *Pronotocrepis* and *Teleorhinus* species

	Length						Width			InterOc	AntSeg2
	Body	CunClyp	Head	Pron	Scut	Cun	Head	Pron	Scut		
<i>P. clavicornis</i> ♂											
(N = 5)											
Mean	5.46	4.29	0.67	0.95	0.69	0.62	1.19	2.06	1.25	0.63	2.27
SD	0.21	0.09	0.08	0.04	0.02	0.15	0.03	0.08	0.08	0.04	0.09
Range	0.50	0.21	0.19	0.10	0.06	0.41	0.07	0.19	0.20	0.10	0.23
Min	5.25	4.17	0.54	0.91	0.67	0.41	1.14	1.95	1.20	0.57	2.16
Max	5.76	4.38	0.73	1.01	0.72	0.82	1.22	2.14	1.40	0.67	2.39
<i>P. clavicornis</i> ♀											
(N = 5)											
Mean	5.72	4.47	0.79	0.98	0.71	0.71	1.25	2.13	1.19	0.69	2.38
SD	0.28	0.05	0.07	0.03	0.01	0.12	0.05	0.01	0.07	0.01	0.11
Range	0.76	0.12	0.17	0.08	0.03	0.29	0.15	0.03	0.19	0.03	0.30
Min	5.35	4.39	0.72	0.93	0.70	0.63	1.16	2.11	1.08	0.68	2.23
Max	6.11	4.52	0.89	1.01	0.72	0.92	1.31	2.15	1.27	0.71	2.53
<i>T. crataegi</i> ♂											
(N = 2)											
Mean	6.11	4.42	0.49	1.01	0.67	0.87	1.02	1.53	0.96	0.42	1.76
SD	0.04	0.01	0.02	0.02	0.02	0.04	0.02	0.04	0.01	0.02	0.03
Range	0.06	0.01	0.02	0.03	0.03	0.06	0.03	0.05	0.02	0.04	0.04
Min	6.08	4.41	0.48	0.99	0.66	0.84	1.01	1.50	0.95	0.40	1.73
Max	6.14	4.42	0.50	1.02	0.69	0.90	1.03	1.55	0.97	0.43	1.78
<i>T. crataegi</i> ♀											
(N = 1)											
Mean	5.25	4.01	0.63	0.88	0.55	0.67	0.97	1.22	0.81	0.46	1.68
<i>T. cyaneus</i> ♂											
(N = 5)											
Mean	8.03	5.57	0.75	1.07	0.80	1.20	1.02	1.75	1.17	0.49	2.34
SD	0.20	0.13	0.09	0.06	0.05	0.13	0.02	0.02	0.12	0.01	0.07
Range	0.49	0.34	0.22	0.16	0.14	0.36	0.05	0.05	0.33	0.03	0.18
Min	7.74	5.42	0.65	0.99	0.73	0.98	1.00	1.73	1.02	0.47	2.23
Max	8.23	5.77	0.87	1.15	0.87	1.34	1.05	1.78	1.34	0.50	2.41
<i>T. cyaneus</i> ♀											
(N = 5)											
Mean	6.12	4.82	0.71	1.10	0.67	0.69	1.09	1.60	1.08	0.53	2.25
SD	0.27	0.19	0.10	0.06	0.02	0.08	0.02	0.04	0.05	0.04	0.14
Range	0.51	0.50	0.25	0.17	0.06	0.21	0.05	0.10	0.11	0.08	0.34
Min	5.91	4.60	0.61	1.02	0.64	0.62	1.08	1.56	1.04	0.49	2.08
Max	6.42	5.09	0.86	1.19	0.70	0.83	1.13	1.66	1.15	0.57	2.41
<i>T. tephrosicola</i> ♂											
(N = 5)											
Mean	6.59	5.04	0.75	1.16	0.75	0.79	1.03	1.62	1.14	0.47	1.76
SD	0.53	0.46	0.16	0.08	0.05	0.09	0.05	0.10	0.08	0.04	0.17
Range	1.43	0.93	0.36	0.19	0.12	0.25	0.13	0.24	0.23	0.10	0.39
Min	5.99	4.61	0.57	1.08	0.69	0.66	0.97	1.51	1.04	0.43	1.67
Max	7.41	5.54	0.93	1.27	0.81	0.91	1.10	1.74	1.27	0.52	2.06
<i>T. tephrosicola</i> ♀											
(N = 5)											
Mean	6.63	5.21	0.81	1.29	0.72	0.72	1.12	1.68	1.09	0.57	1.81
SD	0.44	0.40	0.08	0.12	0.11	0.05	0.05	0.09	0.09	0.02	0.28
Range	1.14	1.07	0.20	0.33	0.30	0.13	0.13	0.23	0.25	0.06	0.68
Min	6.01	4.65	0.74	1.11	0.58	0.66	1.06	1.54	0.95	0.54	1.61
Max	7.15	5.72	0.94	1.44	0.88	0.79	1.20	1.77	1.20	0.60	2.29

*Pronotocrepis ruber*: HOLOTYPE: Female: [USA] Oregon [Lake Co.] Hart Mountain [42.39944°N 119.77944°W, 1905 m] 17 Jun 1938, Gray and Schuh (AMNH\_PBI 00069006) (USNM).

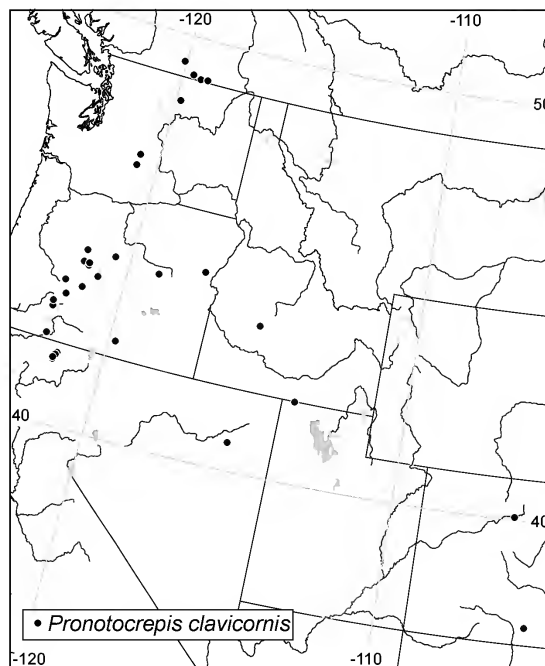
DIAGNOSIS, DESCRIPTION, HOSTS: See generic diagnosis and description.

DISTRIBUTION: Canada: British Columbia (map 4). United States: Colorado, Idaho, Nevada, Oregon, and Utah (map 4).

DISCUSSION: Knight (1969) described *Pronotocrepis ribesi* from Washington and *P. ruber* from Oregon. He distinguished both from *P. clavicornis*, described from Colorado (Knight, 1929), by the thickness of the base of the second antennal segment compared to thickness of the first antennal segment. He distinguished *P. ribesi* and *P. ruber* by the coloration of the embolium (Knight, 1969): pallid in *P. ribesi*, blood red in *P. ruber*. Knight's

comparisons of *P. clavicornis*, *P. ruber*, and *P. ribesi* must be viewed with skepticism because he was comparing the two male holotypes (*P. clavicornis*, *P. ribesi*) with a female holotype of *P. ruber*. Especially the second antennal segment shows distinct width differences between the sexes. Examination of the *P. clavicornis*, *P. ruber*, *P. ribesi*, and other specimens on hand revealed that embolium coloration ranges from pallid to deep red and is not correlated with the thickness of the second antennal segment basally. Specimens from the same collecting event with brown, red, or yellowish embolium showed no differences in the genitalic structures, and I am therefore treating *P. ribesi* and *P. ruber* as junior synonyms of *P. clavicornis*, new synonymy.

SPECIMENS EXAMINED: **CANADA: British Columbia:** Hedley, 49.35°N 120.08333°W, 09 Jul 1965, F.I.S., *Ribes* sp. (Grossulariaceae), 1 ♀ (00071585) (CNC). Osoyoos, Anarchist Mountain, 49.03333°N 119.33333°W, 13 Jul 1970, L.A. Kelton, 1 ♀ (00071583) (CNC). Osoyoos, Mt. Kobau Rd., km 10.9, 49.03333°N 119.46666°W, 10 Jul 1994, G.G.E. Scudder, *Ribes* sp. (Grossulariaceae), 1 ♂ (00071580), 1 ♀ (00071588) (CNC). Rock Creek, 49.05°N 119.1°W, 30 May 1958, F.I.S., *Ribes* sp. (Grossulariaceae), 1 ♀ (00071586) (CNC). **USA: Arizona: Apache Co.:** 16 mi N of Concho, 28 Aug 1967, H.A. Scullen, 1 ♀ (00075894) (ORSU). **California: Siskiyou Co.:** 0.3 mi SE of Mammoth Crater, Klamath National Forest, 41.68971°N 121.54283°W, 1585 m, 26 Jun 1979, M.D. Schwartz, *Ribes cereum* (Grossulariaceae), 1 ♀ (00058499) (AMNH). 2.5 mi N of Medicine Lake on Medicine Lake Rd, 41.61781°N 121.59778°W, 750 m, 18 Jul 1985, G.M. Stonedahl and J.D. McIver, *Ribes* sp. (Grossulariaceae), 1 ♂ (00059316) (AMNH). Medicine Lake Road, 41.58167°N 121.59778°W, 1585 m, 26 Jun 1979, G. Stonedahl, *Ribes cereum* (Grossulariaceae), 3 ♂ (00058367–00058369), 12 ♀ (00058370–00058381) (AMNH); 26 Jun 1979, J.D. Lattin, *Ribes cereum* (Grossulariaceae), 1 ♂ (00075868), 3 ♀ (00075869–00075871) (ORSU). Just S of Lava Beds National Monument on Medicine Lake Road, Mammoth Crater, 41.75333°N 121.50556°W, 1625 m, 26 Jun 1979, R.T. and Joe Schuh, 1 ♂ (00058488) (AMNH). **Colorado: Grand Co.:** Hot Sulphur Springs,



MAP 4. Distribution of *Pronotocrepis clavicornis*.

40.07306°N 106.10222°W, 13 Jul 1949, R.H. Beamer, 4♂ (00074842–00074844, 00074885), 2♀ (00074845, 00074846) (KU). **Idaho: Elmore Co.:** Featherville, 43.61°N 115.25722°W, 02 Jul 1961, J.C. Brandt, 1♀ (00075349) (USNM). **Nevada: Elko Co.:** Ruby Mountains, Lomoille Canyon, E of Powerhouse Picnic Area, 40.69222°N 115.475°W, 1829 m, 16 Jun 1983, R.T. Schuh and M.D. Schwartz, *Ribes* sp. (Grossulariaceae), 3♂ (00058342–00058344), 8♀ (00058345–00058352) (AMNH). Ruby Mountains, Lomoille Canyon, E of Powerhouse Picnic Area, 40.69222°N 115.475°W, 1885 m, 16 Jun 1983, R.T. Schuh and M.D. Schwartz, *Ribes inerme* (Grossulariaceae), 1♂ (00058501) (AMNH). **Oregon: Baker Co.:** Durkee, 44.58222°N 117.46361°W, 17 Jun 1941, K.M. Fender, 2♀ (00075903, 00075904) (ORSU). **Crook Co.:** 0.5 mi W of Ochoco National Forest on Rt 26, T14S R18E Sec 11, 44.3708°N 120.5348°W, 22 Jun 1979, R.T. Schuh, *Ribes* sp. (Grossulariaceae), 2♀ (00058440, 00058441) (AMNH). Ochoco National Forest, T14S R18S S11, 44.29984°N 120.8703°W, 22 Jun 1979, M.D. Schwartz, *Ribes cereum* (Grossulariaceae), 1♂ (00058491) (AMNH). **Deschutes Co.:** 10 Miles West of Bend, 44.05815°N 121.51571°W, 21 Jun 1939, Gray and Schuh, 1♀ (00058495) (AMNH). 14 mi S of Millican, R15E T20S Sec 34, 43.798°N 120.9166°W, 1646 m, 21 Jun 1979, R.T. Schuh, *Ribes* sp. (Grossulariaceae), 1♀ (00058493) (AMNH). 3m NE of Sisters T14S R10E Sec 23, Indian Ford Road, 44.3419°N 121.5026°W, 10 Jun 1979, M.D. Schwartz, *Ribes cereum* (Grossulariaceae), 5♂ (00058360–00058364), 2♀ (00058365, 00058366) (AMNH). 4.2 mi S Millican, Forest Service Rd 2012, 43.81833°N 120.91889°W, 1524 m, 21 Jun 1979, G.M. Stonedahl, *Ribes* sp. (Grossulariaceae), 7♂ (00058325–00058330, 00058492), 12♀ (00058331–00058341, 00058502) (AMNH). 4.2 mi S of Millican, 43.81845°N 120.91889°W, 1524 m, 21 Jun 1979, R.T. Schuh, *Ribes* sp. (Grossulariaceae), 11♂ (00058382–00058392), 23♀ (00058393–00058415) (AMNH). *Ribes* sp. (Grossulariaceae), 1♀ (00071587) (CNC). 5 mi S Bend, 43.98591°N 121.31417°W, 10 Jun 1971, Oman, 6♂ (00075884–00075889), 4♀ (00075890–00075892, 00075896) *Ribes* sp. (Grossulariaceae), 1♀ (00075895) (ORSU). Bend, 44.05833°N 121.31417°W, 15 Jun 1968, P. Oman, 2♀ (00075897, 00075898) *Ribes* sp. (Grossulariaceae), 1♀ (00075899) (ORSU). Pine Mountain Observation, 43.80306°N 120.91278°W, 1829 m, 21 Jun 1979, G.M. Stonedahl, *Ribes* sp. (Grossulariaceae), 5♂ (00058319–00058323), 1♀ (00058324) (AMNH). *Ribes* sp. (Grossulariaceae), 1♂ (00071582) (CNC). Pine Mountain Observation T20S R15E S33, 43.80306°N 120.91278°W, 1829 m, 21 Jul 1979, M.D. Schwartz, *Ribes cereum* (Grossulariaceae), 3♂ (00058357–00058359), 12♀ (00058465–00058476) (AMNH). Pine Mountain, 4mi S Millican, 43.80306°N 120.91278°W, 1518 m, 21 Jun 1979, G.M. Cooper, *Ribes* sp. (Grossulariaceae), 2♂ (00075872, 00075873), 10♀ (00075874–00075883) (ORSU). University of Oregon, Pine Mountain Observatory, 43.79194°N 120.94083°W, 1829 m, 21 Jun 1979, R.T. Schuh, *Ribes* sp. (Grossulariaceae), 10♂ (00058416–00058425), 10♀ (00058426–00058435) (AMNH). 1♂ (00085613) (BMNH). **Grant Co.:** 8 mi N Seneca, 44.25058°N 118.97056°W, 1471 m, 14 Jun 1973, Oman and Musgrave, 7♂ (00075856–00075862), 4♀ (00075864–00075867), 1 nymph (00075863) (ORSU). **Klamath Co.:** 14 mi NW of Rt 97 on Rt 58, 43.50972°N 121.93207°W, 03 Jul 1982, G.M. Stonedahl and T.J. Henry, *Ribes* sp. (Grossulariaceae), 2♂ (00058460, 00058490), 2♀ (00058449, 00058450) (AMNH). 16.4 mi N jct Hwy 62 on Hwy 97, 42.81199°N 122.08132°W, 1487 m, 08 Jul 1980, G.M. Stonedahl, *Ribes* sp. (Grossulariaceae), 1♂ (00058353), 3♀ (00058354–00058356) (AMNH). 19 mi SE of La Pine on Hwy 31, 43.44325°N 121.33855°W, 1448 m, 25 Jun 1979, J.D. Lattin, *Ribes* sp. (Grossulariaceae), 1♂ (00075900), 2♀ (00075901, 00075902) (ORSU). 2 mi S of Chemult, Rt 97, 43.18769°N 121.78167°W, 03 Jul 1982, G.M. Stonedahl and T.J. Henry, *Ribes* sp. (Grossulariaceae), 9♂ (00058451–00058459), 11♀ (00058442–00058448, 00058461–00058464) (AMNH). *Ribes* sp. (Grossulariaceae), 1♂ (00071581) (CNC). Spencer Creek, 42.14944°N 122.02667°W, 01 Jul 1956, J.D. Vertrees, 1♀ (00058498) (AMNH). Union Creek, Crater Lake, 42.94389°N 122.10556°W, 03 Jul 1952, M. Cazier, W. Gertsch, and R. Schrammel, 1♂ (00058489) (AMNH). **Lake Co.:** Hart Mountain, 42.39944°N 119.77944°W, 17 Jun 1938, Schuh and Gray, 2♀ (00058494, 00058497) (AMNH). **Utah: Box Elder Co.:** Raft River Mountains, 5mi SW Clear Crk. Cmpgrd. T14N R13N, 41.99118°N 113.64017°W,

2164 m, 31 Jul 1981, M.D. Schwartz, *Ribes inerme* Rydb. (Grossulariaceae), 9 ♂ (00058477–00058485), 5 ♀ (00058436–00058439, 00058486) (AMNH). *Ribes inerme* (Grossulariaceae), 1 ♀ (00071584) (CNC). **Washington: Okanogan Co.:** 8 mi WNW of Republic (Ferry Co.), Sweat Creek, 48.42324°N 119.83129°W, 1097 m, 20 Jul 1978, N. Herman, 1 ♂ (00058487) (AMNH). **Yakima Co.:** Wenas rd., T16N R17E Sec. 3 ca. 11 mi SW Ellensburg, 46.9061°N 120.6853°W, 13 Jun 1989, R.S. Zack, 1 ♂ (00071579) (CNC).

## GENUS *TELEORHINUS* UHLER

Type species: *Teleorhinus cyaneus* Uhler, 1890: 74 (by monotypy).

*Teleorhinus* Uhler, 1890: 74 (original description); Kirkaldy, 1906: 128 (catalog); Reuter, 1909: 65 (description, comments), 1910: 166 (catalog); Van Duzee, 1917: 367 (catalog); Knight, 1922: 67 (note), 1923: 474 (key), 1941: 15 (description), 17 (description), 52 (comments), 1968b: 64 (key to species); Blatchely, 1926: 915 (key); Carvalho, 1952: 71 (catalog), 1955a: 60 (key), 1958: 179 (catalog); Schuh, 1974: 298 (description, discussion), 303 (note); McIver and Stonedahl, 1987a: 258 (note), 1987b: 278 (note).

**DIAGNOSIS:** Recognized by complete black dorsal surface with deep punctation on pronotum and hemelytra; head elongate, vertical (fig. 7); second antennal segment inflated distally; vesica simple; secondary gonopore not readily identifiable as closed sclerotized ring, but rather as elongate structure with lobes laterally bearing distinct denticles, dorsal labiate plate of female genitalia with large rings. Distinguished from *Orectoderus* by shape of metathoracic pleuron and scent-gland auricle with evaporatory area (figs. 4B, 10B) and by vesica (figs. 5, 9), shape of head (figs. 4A, 10A), and shape of pronotum (figs. 3, 7). Females in *Teleorhinus* always macropterous (fig. 7) whereas in *Orectoderus* females brachypterous (fig. 3).

**REDESCRIPTION:** *Male:* Total length 5.99–8.23, length apex clypeus-cuneus fracture 4.41–5.77, width across pronotum 1.50–1.55. **COLORATION:** Entire dorsal surface black (fig. 7), sometimes vertex castaneous; cuneus reddish black; antennal segments 1 to 4 black with second antennal segment sometimes yellowish; venter black; pro-, meso- and metapleuron black; coxae lighter than femora, yellowish or orange, with brown base; trochanter and femora bright red-orange or femora red-orange and tibiae more yellow-brown; tibia usually brown basally; all tarsal segments brown or second segment lighter. **SURFACE AND VESTITURE:** General aspect very shiny; pronotum and scutellum rugose; dorsal surface including antennal segments clothed with reclining short black setae or lighter golden shiny setae (fig. 10D); dull area below ventral margin of eye (fig. 7); tibia with strong long black spines; claws over most of length straight, curved apically; pulvillus connate to claw on its entire length (fig. 10C). **STRUCTURE:** Elongate to elongate ovoid (fig. 7); pronotum and corium punctated; head elongate and vertical (figs. 7, 10A); labium reaching to mesocoxa or beyond; vertex with or without carina; second antennal segment inflated (fig. 7). **GENITALIA:** Phallosome elongate or short and stout (fig. 9); vesica simple, apical part beyond secondary gonopore bent or straight, tapering into point (fig. 9); anterior process of left paramere rounded apically; right paramere straight or apical part distinctly bent (fig. 9).

*Female:* Total length 5.91–7.15, length apex clypeus-cuneus fracture 4.60–5.72, width across pronotum 1.54–1.77. Coloration, surface, vestiture and structure as in male, except second

antennal segment more inflated distally (fig. 7); body more strongly ovoid than male. GENITALIA: Dorsal labiate plate sclerotized laterally; sclerotized rings of dorsal labiate plate ovoid and roundish apically or distinctly elongated and pointed apically; dorsal labiate plate sometimes with medioposterior triangular sclerotized process caudally; posterior wall with spinose field on surface; sclerotized part of posterior wall with lobe medially (fig. 12).

HOSTS: Asteraceae, Ericaceae, Fabaceae, Grossulariaceae, Pinaceae, Rhamnaceae, and Rosaceae.

DISTRIBUTION: United States, Canada, and Mexico.

DISCUSSION: Knight (1968b) based his species key mainly on characters of the second antennal segment. Although there is a faint difference in the inflation of the apical part of the second antennal segment, it is difficult to characterize. The genitalic structures are a far more reliable indicator of species differences (figs. 9, 11). For the females the posterior wall seems to be the best character to separate the species (fig. 11).

A very similar looking Mirinae species, *Ectopiocerus anthracinus* Uhler, 1890, can be collected in the same habitats as *Teleorhinus* and confused with *Teleorhinus* species on the great similarity of appearance, but its pretarsal and genitalic characters clearly distinguish *E. anthracinus* as a member of the Mirinae.

#### KEY TO SPECIES OF *TELEORHINUS* UHLER

##### Males

1. Apex of vesica straight beyond secondary gonopore (fig. 9); dull area below ventral margin of eye narrow (fig. 7) ..... *crataegi*, new species
- Apex of vesica bent beyond secondary gonopore (fig. 9); dull area below ventral margin of eye not only a narrow band (fig. 7) ..... 2
2. Apex of vesica flattened beyond secondary gonopore; dull area below ventral margin of eye lunate and wide. .... *tephrosicola* Knight
- Apex of vesica slightly curved beyond secondary gonopore (fig. 9); dull area below ventral margin of eye not recognizable as band (fig. 7)..... *cyaneus* Uhler

##### Females

1. Inflated distal part of second antennal segment distinctly shorter than narrow proximal part (fig. 7); posterior wall without medioposterior sclerotized process. .... *tephrosicola* Knight
- Inflated distal part of second antennal segment more than half the entire length of segment. .... 2
2. Second antennal segment slightly inflated distally (fig. 7); total body length 5.25 mm (table 3)..... *crataegi*, new species
- Second antennal segment strongly inflated distally (fig. 7); total body length 5.91–6.42 mm (table 3)..... *cyaneus* Uhler

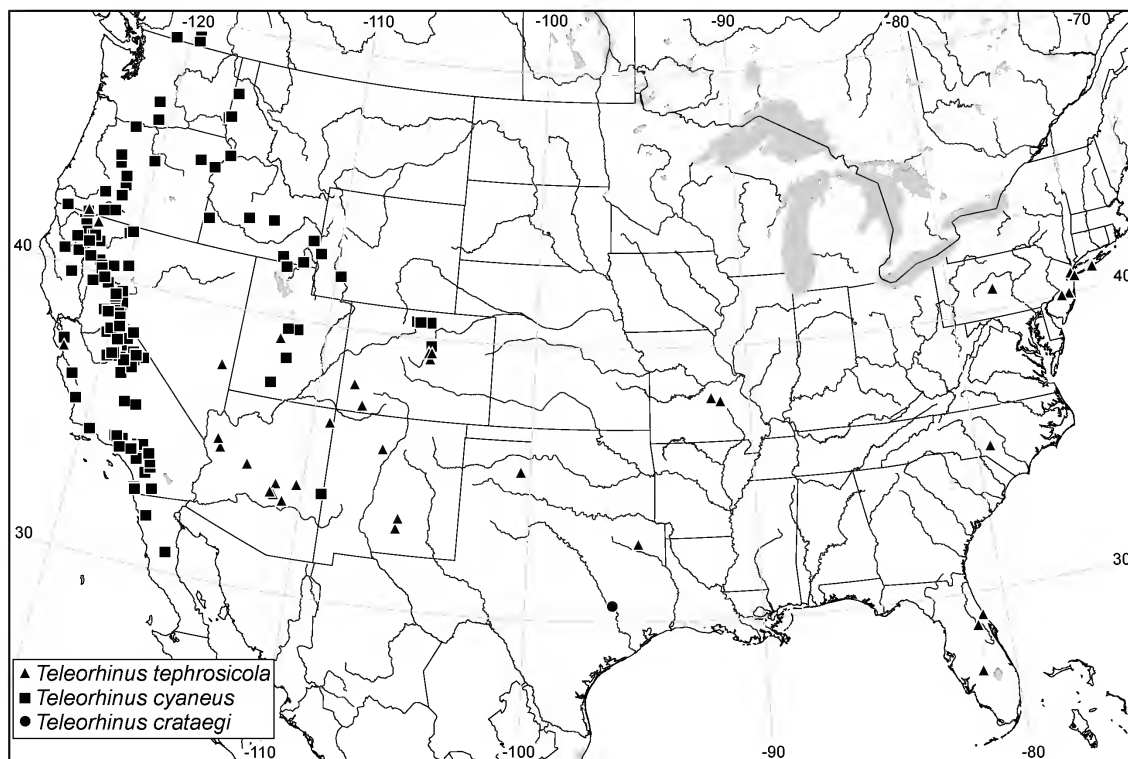
*Teleorhinus crataegi*, new species

Figures 7, 9; map 5; table 3

HOLOTYPE: Male: USA: Texas: *Brazos Co.*: Koppe Bridge [30.57222°N 96.32611°W] 20 Apr 1966, J.C. Schaffner, *Crataegus* sp. (Rosaceae) (AMNH\_PBI 00121395) (CNC). PARATYPES: USA: Texas: *Brazos Co.*: Koppe Bridge [30.57222°N 96.32611°W] 20 Apr 1966, J.C. Schaffner, *Crataegus* sp. (Rosaceae), 1 ♂ (00121396), 1 ♀ (00121397) (CNC).

DIAGNOSIS: Recognized by vesica with apical part beyond secondary gonopore straight (fig. 9) and vestiture shining, golden, brighter than in *Teleorhinus cyaneus* and *T. tephrosicola*; second antennal segment not as inflated as in *T. cyaneus* and *T. tephrosicola* (fig. 7) and not twice as long as length of the pronotum (table 3); body form more slender and shorter than *T. cyaneus* and *T. tephrosicola* (fig. 7); dull area below eye just narrow band (fig. 7); phallosome elongate, pointed (fig. 9); left paramere with anterior process round apically, posterior process distinct pointed (fig. 9); right paramere slightly curved (fig. 9). Most similar to *T. tephrosicola* in general aspect, but distinguished by its smaller body length (table 3), vesica straight beyond secondary gonopore (fig. 9) and second antennal segment inflated more than half of its length (fig. 7).

DESCRIPTION: *Male*: Total length 6.08–6.14, length apex clypeus-cuneus fracture 4.41–4.42, width across pronotum 1.50–1.55. COLORATION: Labium yellow-brown, only segment four dark brown; pronotum, mesoscutum, scutellum, and hemelytra black (fig. 7); cuneus slightly



MAP 5. Distribution of *Teleorhinus crataegi*, *T. cyaneus* and *T. tephrosicola*.

dark reddish brown; second antennal segment with small brown ring basally followed by band of brownish yellow, apical part black; coxae and trochanters bright yellow, brown basally; femora bright orange; tibia yellow-brown basally; first and third tarsal segments black, second tarsal segment yellow-brown. SURFACE AND VESTITURE: Dorsal surface, including antennal segments, clothed with reclining short, golden, shining setae; dull area below ventral margin of eye only narrow band (fig. 7). STRUCTURE: Rather elongate (fig. 7); labium reaching mesotrochanter. MALE GENITALIA: Vesica with apical part beyond secondary gonopore straight (fig. 9); phallosome elongate, pointed (fig. 9); left paramere with anterior process round apically, posterior process distinct pointed (fig. 9); right paramere slightly curved (fig. 9).

*Female*: Total length 5.25, length apex clypeus-cuneus fracture 4.01, width across pronotum 1.22. Coloration, surface, vestiture, and structure as in male, except second antennal segment more inflated distally (fig. 7); inflated distal part of second antennal segment more than half of the entire segment length (fig. 7).

ETYMOLOGY: Named for the host plant, *Crataegus* sp., on which the only known specimens were collected.

HOST: *Crataegus* sp. (Rosaceae).

DISTRIBUTION: Only known from a single locality in Texas (map 5).

DISCUSSION: Because this species is so far only known from two males and one female I refrained from dissecting the only available female.

### *Teleorhinus cyaneus* Uhler

Figures 7, 9, 10, 11, 12; map 5; table 3

*Teleorhinus cyaneus* Uhler, 1890: 75 (new species, description); Kirkaldy, 1906: 128 (catalog); Van Duzee, 1916b: 42 (list); Carvalho, 1958: 180 (catalog); Knight, 1968b: 65, fig. 83 (diagnosis, distribution; fig. head and antenna); Wyniger et al., 2008: 339 (presence of brochosomes), 338, fig. 7C (detail of tarsus).

*Teleorhinus brindleyi* Knight, 1968b: 65 (new species, description). NEW SYNONYMY.

*Teleorhinus nigricornis* Knight, 1968b: 66 (new species, description). NEW SYNONYMY.

TYPE MATERIAL (EXAMINED): *Teleorhinus cyaneus*: LECTOTYPE: Female: [USA] California: Los Angeles Co.: Los Angeles [34.05222°N 118.24278°W], Coquillett Collection, 1 ♀ (AMNH\_PBI 00069002) (USNM). PARALECTOTYPES: [USA: California] Los Angeles Co.: Los Angeles [34.05222°N 118.24278°W], Coquillett Collection, 1 ♀ (00069003) (USNM); Los Angeles County [34.36667°N 118.2°W], 15 May 1900, 1 ♂ (00071969) (CNC).

*Teleorhinus brindleyi*: HOLOTYPE: Female: [USA: Idaho: Latah Co.] Moscow Mountain [46.80361°N 116.86778°W] 21 Jun 1936, T.A. Brindley (AMNH\_PBI 00068999) (USNM). PARATYPES: [USA: Idaho: Kootenai Co.] Coeur d'Alene [47.67778°N 116.77944°W, 657 m] 26 Jun 1935, J.M. Beck, 1 ♀ (00071970) (CNC). [Wyoming: Sweetwater Co.] Farson, Big Sandy River [41.85151°N 109.78281°W] D. Elden Beck, 1 ♂ (00068786) (USNM).

*Teleorhinus nigricornis*: HOLOTYPE: Female [USA: Washington: Yakima Co.] Tieton Canyon [46.65217°N 120.7248°W] 21 Jun 1932, A.R. Rolfs (AMNH\_PBI 00069000) (USNM). ALLOTYPE:

[Washington: Yakima Co.] Tieton Canyon [46.65217°N 120.7248°W] 21 Jun 1932, A.R. Rolfs, 1 ♂ (00068789) (USNM). PARATYPE: [USA: California: Los Angeles Co.] Lake Tahoe [34.16531°N 117.67847°W] 10 Jun 1891, Coquillett, 1 ♂ (00071968) (CNC).

DIAGNOSIS: Recognized by vesica beyond secondary gonopore shorter than in *Teleorhinus crataegi* and *T. tephrosicola* and bent just apically (fig. 9) and males more elongated than in *T. crataegi* and *T. tephrosicola* (fig. 9); inflated part of second antennal segment more than proximal half (fig. 7); second antennal segment more than twice as long as length of the pronotum (table 3); dull area below eye not recognized as band (fig. 7); phallosome distinctly elongate, pointed (fig. 9); left paramere with anterior process rounded apically, posterior process rounded (fig. 9); right paramere straight (fig. 9); female distinguished from *T. tephrosicola* by shape of sclerotized rings of dorsal labiate plate (fig. 12) and posterior wall bearing medioposterior triangular sclerotized process caudally (fig. 12).

REDESCRIPTION: *Male*: Total length 7.74–8.23, length apex clypeus-cuneus fracture 5.42–5.77, width across pronotum 1.73–1.78. COLORATION: Vertex sometimes brownish (fig. 7); labium black; coxae red-orange or whitish yellow with brown base; trochanter and femora bright red-orange; tibia more yellowish brown, dark brown basally; all tarsal segments brown. SURFACE AND VESTITURE: Very shining; dorsal surface including antennal segments clothed with short, black, reclining setae; dull appearing area below ventral margin of eye not recognizable as band (fig. 7); forefemora on inner surface with medial setae-free spots (fig. 10E). STRUCTURE: Rather elongate; labium surpassing mesocoxa; vertex with transverse carina. GENITALIA: Vesica simple, apical part beyond secondary gonopore bent, tapering into point (fig. 9); phallosome distinctly elongate, pointed (fig. 9); left paramere with anterior process rounded apically, posterior process rounded (fig. 9); right paramere straight (fig. 9).

*Female*: Total length 5.91–6.42, length apex clypeus-cuneus fracture 4.60–5.09, width across pronotum 1.56–1.66. Coloration, surface, vestiture and structure as in males, except second antennal segment more widened distally; inflated distal part of second antennal segment more than half of the entire segment length (fig. 7); body more oval shaped than male. GENITALIA: Sclerotized rings of dorsal labiate plate ovoid, round apically (fig. 11); dorsal labiate plate bearing medioposterior triangular sclerotized process caudally; posterior wall with spinose field on surface; sclerotized part of posterior wall with triangular lobe medially (fig. 12).

HOSTS: *Baccharis* sp. (Asteraceae), *Arctostaphylos* sp. (Ericaceae), *Lupinus* sp., *Melilotus officinalis* (Fabaceae), *Ribes aurea* (Grossulariaceae), *Pinus* sp., *P. ponderosa* (Pinaceae), *Ceanothus cordulatus*, *C. cuneatus*, *C. integerrimus*, *C. rigidus*, *C. velutinus*, *Cercocarpus ledifolius*, *Rhamnus californica*, *R. crocea* (Rhamnaceae), *Amelanchier utahensis*, *Cercocarpus ledifolius*, *C. montanus*, *Physocarpus capitatus*, *Prunus emarginata*, *P. subcordata*, *Purshia glandulosa*, and *P. tridentata* (Rosaceae).

DISTRIBUTION: Widely distributed in the western states, from British Columbia in the north to Baja California in the south.

DISCUSSION: Uhler (1890) described *Teleorhinus cyaneus* from two females taken in Los Angeles, California, without designating a holotype. The two female syntypes are housed in the collection of the USNM: one consists of the head with the right antenna consisting of the two segments, and the left antenna with three segments, the pronotum with forelegs, left, middle,

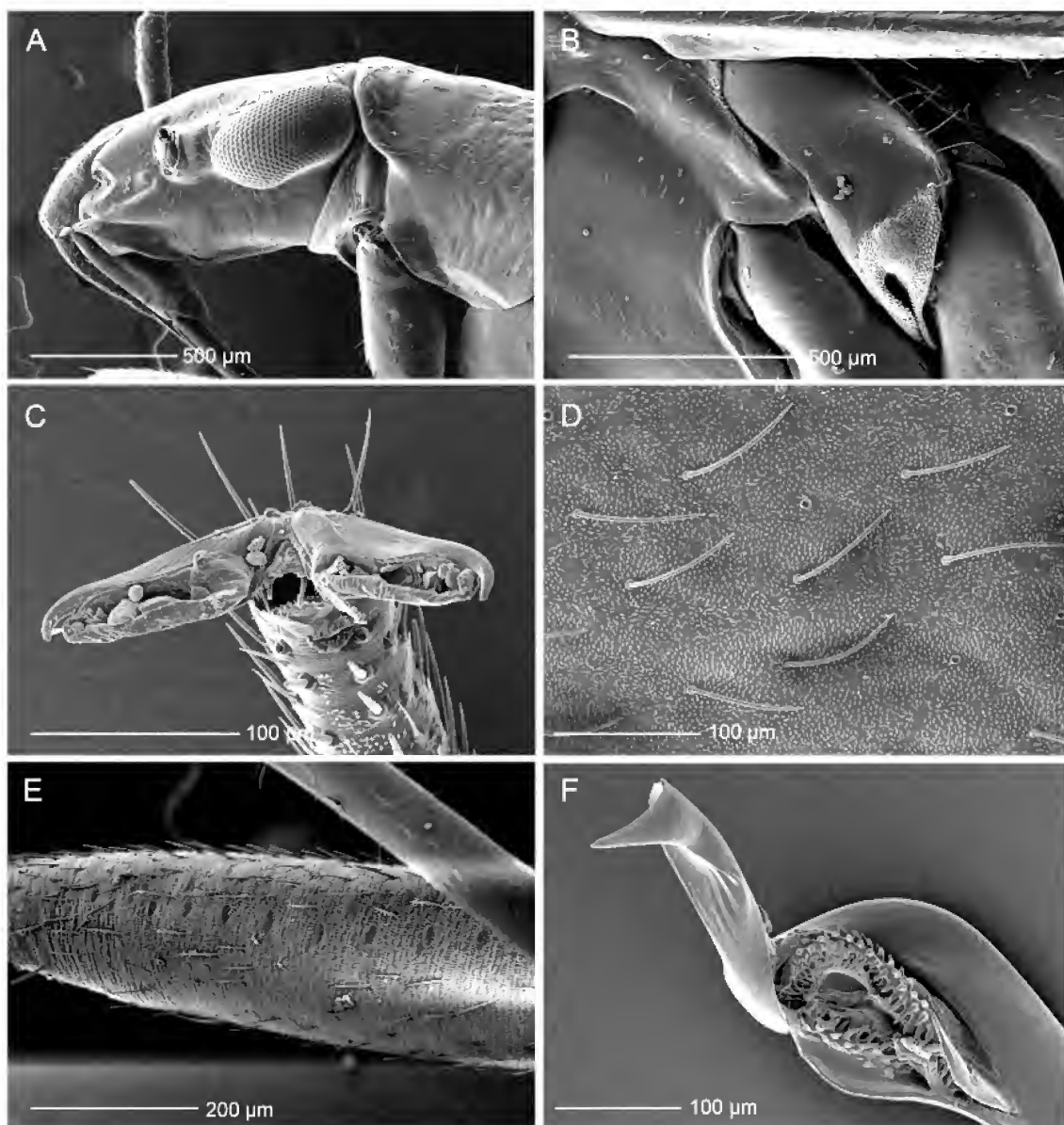


FIGURE 10. Scanning electron micrographs of *Teleorhinus cyaneus* (male). **A.** Head and thorax (lateral view). **B.** Metathoracic scent-gland evaporatory area (lateral view). **C.** Pretarsus (frontal view). **D.** Setae on hemelytra, detail of microstructure. **E.** Inner surface of forefemora. **F.** Vesica with secondary gonopore (dorsolateral view).

and hind leg; glued on the point is a wing fragment. The second female lacks the head, pronotum, and the forelegs. The latter syntype is designated here as lectotype for stabilizing the nomenclature.

Knight (1968b) described *Teleorhinus brindleyi* based on two females and a male from Idaho and Wyoming; the holotype is a female. The second antennal segment of *T. brindleyi* was recorded by Knight (1968b) as bicolored with the base of the segment pale and the apical part

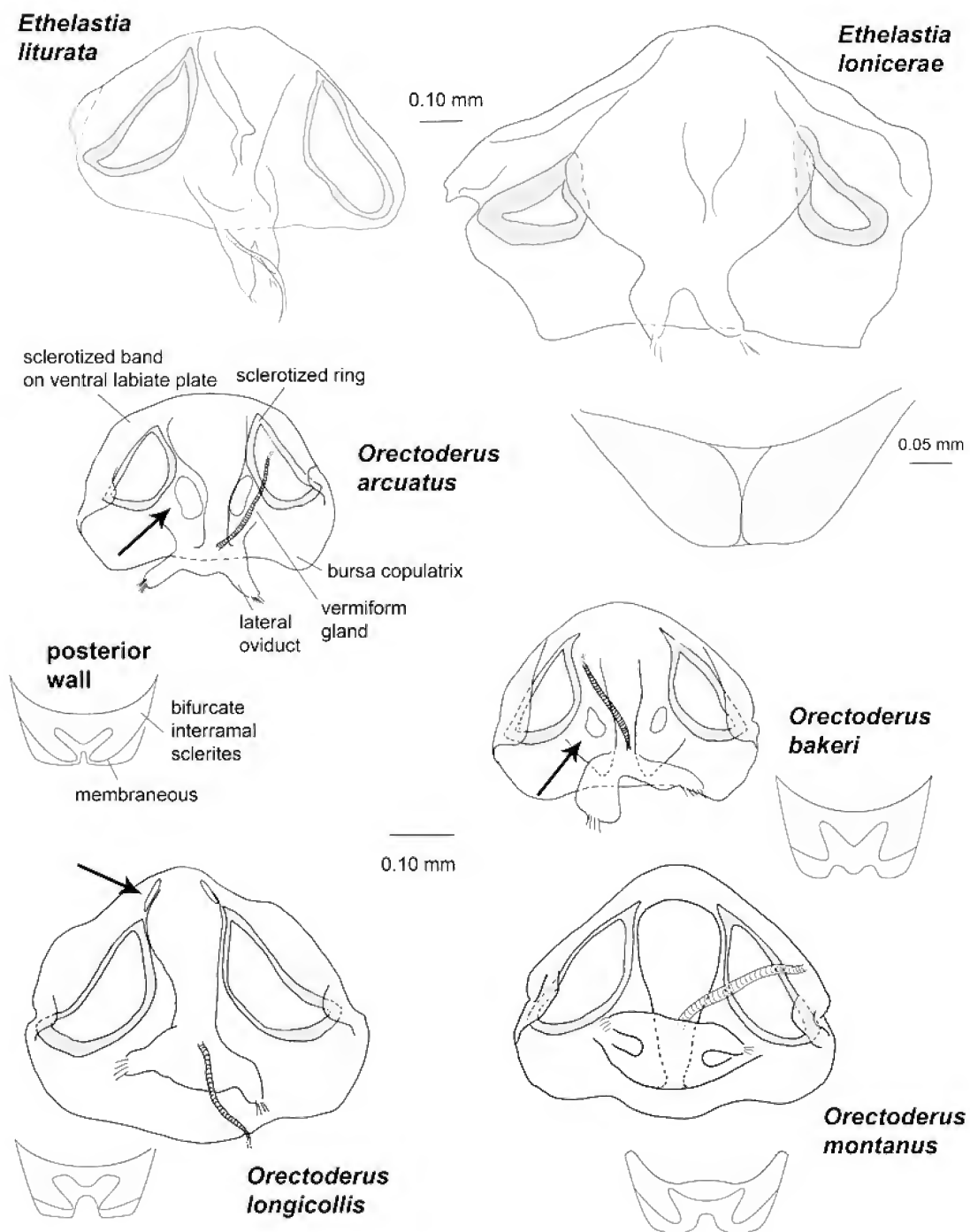


FIGURE 11. Female genitalia of *Ethelastia* spp. and *Orectoderus* spp.; bursa copulatrix (dorsal view), posterior wall (ventral view).

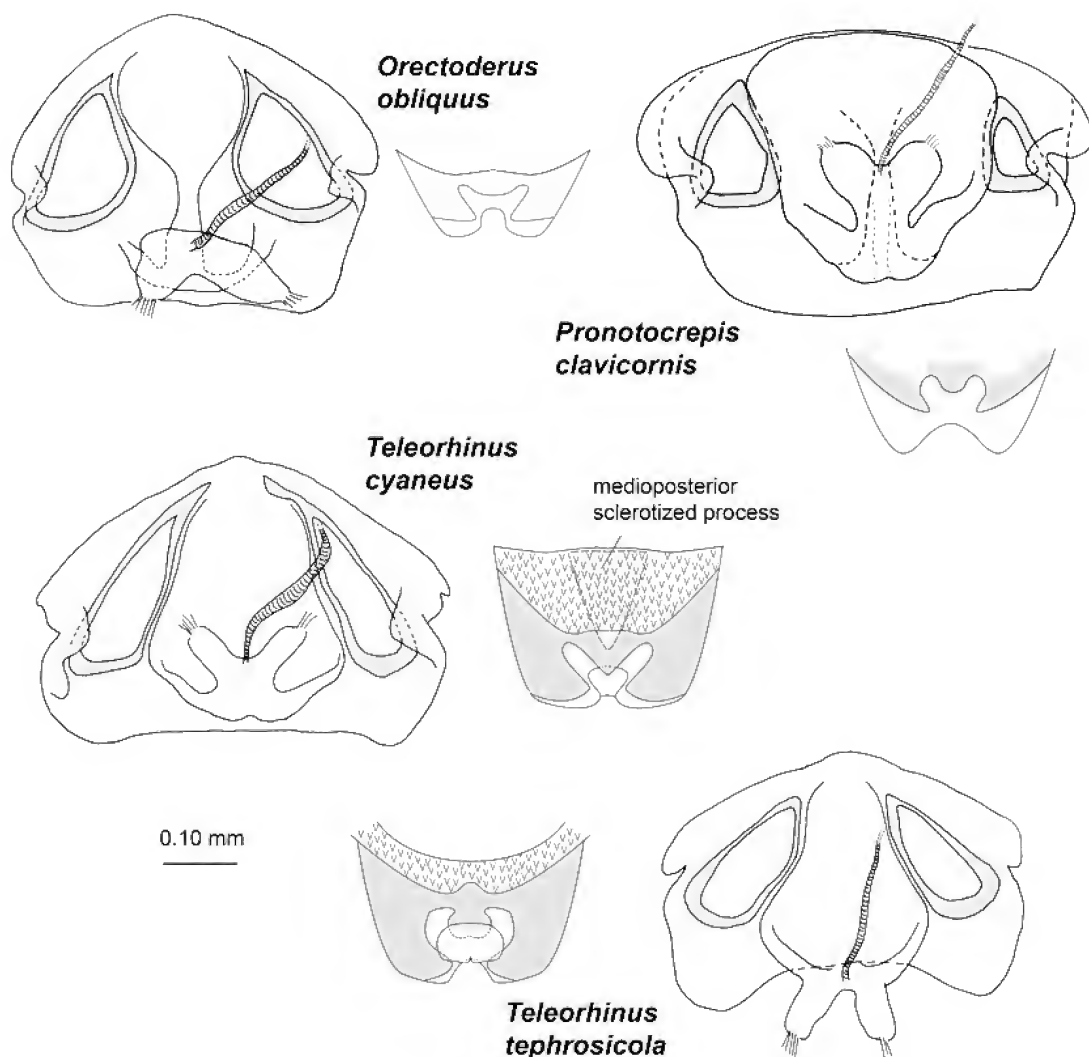


FIGURE 12. Female genitalia of *Orectoderus obliquus*, *Pronotocrepis clavicornis*, and *Teleorhinus* spp.; bursa copulatrix (dorsal view), posterior wall (ventral view).

darkened, whereas that segment in *nigricornis*, from California and Washington, appeared completely dark. My investigations of many specimens throughout the geographical range of the three nominal species indicates that the coloration of the second antennal segment is variable and shows no discernable geographical pattern. Base on this, the investigation of the holotype *T. brindleyi*, and the holotype and paratypes of *T. nigricornis*, I am treating the latter two names as junior synonyms of *T. cyaneus*, new synonymy.

**SPECIMENS EXAMINED:** **CANADA:** **British Columbia:** Manning Provincial Park, Blackwall, 49.08333°N 120.83333°W, 23 Jul 1970, L.A. Kelton, 1 ♀ (00071961) (CNC). Oliver, 49.18333°N 119.55°W, 02 Jul 1974, L.A. Kelton, *Ceanothus* sp. (Rhamnaceae), 1 ♂ (00071957), 3 ♀ (00071958–00071960) (CNC). Summerland, 49.56646°N 119.63951°W, 400 m, 02 Jul 1974–11 Jul 1974, L.A. Kelton, *Ceanothus* sp. (Rhamnaceae), 1 ♀ (00071962) (CNC). **MEXICO:** **Baja California Norte:** 15 mi E of Ensenada,

31.85378°N 116.39933°W, 09 Jun 1980, Brown and Faulkner, 3 ♀ (00074400–00074402) (SDNH). Parque Nacional Sierra San Pedro Martir, Corona Abajo, 30.73866°N 115.24664°W, 14 Jun 1961, E.L. Sleeper, 1 ♂ (00077158), 1 ♀ (00077263) (CAS). **USA: Arizona: Apache Co.:** near Alpine, 33.84806°N 109.1425°W, 27 May 1947, H. & M. Townes, 2 ♂ (00068806, 00068807) (USNM); 29 May 1947, H. & M. Townes, 1 ♂ (00068808) (USNM). **California: Alpine Co.:** 4 mi SE of Markleeville, 38.65398°N 119.72663°W, 2484 m, 10 Jun 1966, W. Gagne, 1 ♂ (00079150) (UCB). Alpine County, 38.6°N 119.8°W, 15 Jul 1934, J.E. Blum, 1 ♂ (00077183) (CAS). Woodfords, 38.77778°N 119.82083°W, 19 Jun 1958, R.P. Allen, 1 ♀ (00079174) (UCB). Just W of Monitor Pass on Rt 89, 38.67556°N 119.61944°W, 2549 m, 27 Jul 1999, M.D. Schwartz, *Prunus subcordata* Benth. (Rosaceae), 1 ♀ (00071953) (CNC). **Butte Co.:** Big Bend Mountain, 39.69722°N 121.44639°W, 28 May 1928, H.H. Keifer, *Ceanothus integerrimus* (Rhamnaceae), 1 ♀ (00077204) (CAS). **Calaveras Co.:** Camp Cornell Maintenance Camp, Stanislaus National Forest on Rt 4, 38.00222°N 120.13611°W, 05 Jul 1994, M.D. Schwartz, *Ceanothus integerrimus* H. and A. (Rhamnaceae), 2 ♂ (00071946, 00071947), 4 ♀ (00071948–00071951) (CNC). **El Dorado Co.:** Echo Lake, 38.83389°N 120.04056°W, 21 Jul 1948, A. Bartel, 1 ♂ (00079157) (UCB). Eldorado National Forest, Silver Creek Campground, 38.75°N 120.33416°W, 1620 m, 05 Jun 1973–06 Jun 1973, D.K. & D.C. Young, 1 ♂ (00086412), 1 ♀ (00086413) (MSU). Fallen Leaf, 38.88306°N 120.07167°W, 03 Jul 1935, F.E. Blaisdell, 1 ♂ (00077177) (CAS); 15 Jul 1931, O.H. Swezey, 1 ♂ (00077194) (CAS). Fallen Leaf Lake, Lake Tahoe, 38.92167°N 120.06167°W, 12 Jul 1915, E.C. Van Dyke, 1 ♀ (00077178) (CAS). Pollock pines, 38.76139°N 120.58556°W, 25 Jun 1948, N.D. Waters, 2 ♂ (00071971, 00071972) (CNC). Pyramid B.S., El Dorado county, 38.76667°N 120.51667°W, 12 Jul 1948, R.C. Bynum, *Ceanothus* sp. (Rhamnaceae), 1 ♂ (00079148) (UCB). Snowline Camp, 38.74639°N 120.62333°W, 21 Jun 1948, O.E. Myers, *Lupinus* sp. (Fabaceae), 1 ♀ (00075975), 1 nymph (00075974) (ORSU); 21 Jun 1948, K.W. Tucker, 1 ♀ (00079170) (UCB). **Fresno Co.:** Huntington Lake, 37.23389°N 119.21194°W, 2134 m, 23 Jul 1919, E.P. Van Duzee, 1 ♀ (00077199) (CAS). Paradise Valley, Kings River, 36.98927°N 118.59725°W, 2134 m, 23 Jul 1910, E.P. Van Duzee, 1 ♀ (00077198) (CAS). Pinehurst, 36.69528°N 119.01556°W, 07 Jun 1935, A.L. Melander, 2 ♀ (00058578, 00058579) (AMNH). **Glenn Co.:** Paskenta Mountain, 39.78763°N 122.53902°W, 02 Jun 1987, J.D. Pinto, 1 ♀ (00082504) (UCR). **Inyo Co.:** 10 mi NW Bishop, 37.46607°N 118.52317°W, 30 Jun 1961, G.W. Frankie, 1 ♀ (00079172) (UCB). 7 mi N of Parchers Camp, 37.28702°N 118.55694°W, 30 Jun 1961, J.K. Drew, 1 ♀ (00077197) (CAS). Wyman Canyon, White Mountains, 37.442°N 118.17895°W, 2591 m, 27 Jun 1961, J.K. Drew, 1 ♂ (00077195) (CAS). **Kern Co.:** 13 mi E of Onyx Walkers Pass, 35.69005°N 117.98755°W, 26 May 1946, J.J. du Bois, 1 ♂ (00079151), 1 ♀ (00079152) (UCB). **Lassen Co.:** Susanville, 40.41639°N 120.65194°W, 17 Jun 1959, Kelton and Madge, greasewood, 3 ♀ (00071963–00071965) (CNC). **Los Angeles Co.:** Claremont, 34.09667°N 117.71889°W, 11 May 1930, unknown, *Rhamnus crocea* (Rhamnaceae), 1 ♂ (00082495) (UCR). Los Angeles, 34.05222°N 118.24278°W, Coquillett Collection, 1 ♀ (00068989) (USNM). Los Angeles County, 34.36667°N 118.2°W, 15 Jun 1900, unknown, 1 ♂ (00068794) (USNM); 15 May 1900, unknown, 1 ♀ (00068796) (USNM). Mint Canyon, 34.41528°N 118.45278°W, 26 May 1937, E.P. Van Duzee, 1 ♂ (00077185), 1 ♀ (00077200), 1 nymph (00077196) (CAS). Saugus 5 mi E Mint Canyon, 34.41139°N 118.53917°W, 20 Apr 1932, E.P. Van Duzee, 3 ♂ (00077167–00077169), 2 ♀ (00077170, 00077171) (CAS). **Madera Co.:** Bass Lake, 37.32472°N 119.56528°W, 914 m, 03 Jun 1942, Arthur J. Walz, *Ceanothus* sp. (Rhamnaceae), 1 ♂ (00079409) (UCB). Madera County, 37.16667°N 119.83333°W, 27 Jul 1946, T.O. Thatcher, *Ceanothus* sp. (Rhamnaceae), 2 ♀ (00079166, 00079173) (UCB). North Fork, 22 Apr 1934, unknown, 1 ♀ (00079165) (UCB). Oakhurst, 37.32806°N 119.64833°W, 26 May 1942, J.T. Polhemus, *Ceanothus* sp. (Rhamnaceae), 1 ♀ (00086635) (UID). **Mariposa Co.:** Yosemite National Park, 37.85°N 119.56667°W, 1201 m, 08 Jun 1931, unknown, 1 ♀ (00079145) (UCB); 15 Jun 1931, unknown, 1 ♂ (00079146) (UCB); 07 Jun 1931, E.O. Essig, 1 ♂ (00079147) (UCB); 20 May 1931, D.W. Clency, 1 ♀ (00082505) (UCR). **Modoc Co.:** Davis Creek, Warner Mountains, 41.73619°N

120.34146°W, 17 Jul 1922, C.L. Fox, 1 ♂ (00077191) (CAS). Fandango Pass Summit, 41.80222°N 120.20583°W, 1890 m, 03 Jul 1979, R.T. Schuh and B.M. Massie, *Cercocarpus ledifolius* (Rosaceae), 1 ♂ (00059314) (AMNH). **Mono Co.:** 7 mi E Bodie, 38.22744°N 118.90982°W, 01 Jul 1964, P. Rude, 1 ♂ (00079149), 1 ♀ (00079168) (UCB). Cloudburst Creek Camp, 38.34333°N 119.54111°W, 18 Jun 1959, F.M. Beer, 1 ♂ (00075955) (ORSU). Leavitt Meadows, 38.3175°N 119.55028°W, 05 Jul 1962, R.P. Allen, 1 ♂ (00073783) (CAFA). Lee Vining, 37.9575°N 119.12083°W, 24 Jun 1948, H.K. Townes, 1 ♀ (00068800) (USNM). Lee Vining, 37.9575°N 119.12083°W, 05 Jul 1962, R.P. Allen, 1 ♂ (00073784) (CAFA). Sonora Pass, 38.32778°N 119.63583°W, 28 Jul 1963, W.F. Chamberlain, 1 ♂ (00058087) (TAMU). Toms Place, 37.56139°N 118.68028°W, 06 Jul 1965, C.D. Johnson, Light Trap, 1 ♂ (00079153) (UCB). Twin Lakes, 37.61806°N 119.00694°W, 15 Jul 1929, unknown, 1 ♀ (00068799) (USNM). **Monterey Co.:** King City, 36.21278°N 121.125°W, 03 May 1974, J. Doyen, 1 ♀ (00079158) (UCB). Paraiso Hot Springs, Bryant Lot 63, 38.77028°N 119.71556°W, 15 Jun 1954, unknown, *Baccharis* sp. (Asteraceae), 1 ♀ (00077202) (CAS). Salinas River at King City, 36.20083°N 121.13495°W, 03 May 1974, J. Powell, *Ribes aurea* (Grossulariaceae), 8 ♀ (00079120–00079127) (UCB). **Nevada Co.:** Sagehen Creek Station near Hobart Mills, 39.4323°N 120.19859°W, 01 Jul 1964, C.N. Slobodchikoff, 1 ♂ (00077188) (CAS). Truckee, 39.32806°N 120.18222°W, 05 Jul 1927, E.P. Van Duzee, 1 ♂ (00077182) (CAS). **Plumas Co.:** Almanor, 40.2175°N 121.17306°W, 24 Jun 1937, B.P. Bliven, 1 ♀ (00077207) (CAS). Chester, 40.30639°N 121.23083°W, 26 Jun 1937, B.P. Bliven, 2 ♀ (00077175, 00077176) (CAS). Johnsville, 39.76083°N 120.69444°W, 25 Jul 1967, Helena Pini, Light Trap, 4 ♂ (00075947–00075950) (ORSU). Lake Almanor, 40.25278°N 121.16028°W, 07 Jul 1952, M. Cazier, W. Gertsch, and R. Schrammel, 1 ♀ (00058587) (AMNH). Quincy, 14 mi W., 39.93694°N 120.94611°W, 11 Jul 1965, W. Tuner, 1 ♀ (00079155) (UCB). **Riverside Co.:** 2 mi Poppet Flat, San Jacinto Mountains, 33.78389°N 116.95778°W, 1524 m, 01 Jun 1940, unknown, *Ceanothus* sp. (Rhamnaceae), 1 ♂ (00079408) (UCB). 2 mi Poppet Flat, San Jacinto Mts., 33.78389°N 116.95778°W, 01 Jun 1949, D.J. Raski, *Ceanothus* sp. (Rhamnaceae), 1 ♂ (00079143) (UCB). 2 mi SE Poppet Flat, San Jacinto Mts., 33.82947°N 116.82696°W, 1524 m, 01 Jun 1940, unknown, *Ceanothus* sp. (Rhamnaceae), 1 ♂ (00079144) (UCB). 2 mi SE Poppet, San Jacinto Mountains, 33.76336°N 116.93309°W, 01 Jun 1940, unknown, *Ceanothus* sp. (Rhamnaceae), 1 ♀ (00077206) *Rhamnus* sp. (Rhamnaceae), 1 ♀ (00077203) (CAS). Beaumont, 33.92944°N 116.97639°W, 19 Jun 1909, E.D. Ball, 1 ♂ (00068791) (USNM). Dark Creek, San Jacinto Mountains, 33.79305°N 116.74583°W, 21 Jul 1940, unknown, *Rhamnus californica* (Rhamnaceae), 1 ♀ (00082497) (UCR). Gavilan, 33.78444°N 117.36916°W, 12 May 1950, unknown, *Rhamnus crocea* (Rhamnaceae), 4 ♂ (00082489–00082490, 00082492, 00082496), 1 ♀ (00082500) (UCR); 07 May 1951, unknown, *Rhamnus crocea* (Rhamnaceae), 2 ♂ (00082491, 00082493), 2 ♀ (00082499, 00082501) (UCR); 14 May 1948, unknown, *Rhamnus crocea* (Rhamnaceae), 1 ♂ (00082494) (UCR). Hurkey Creek P.C. San Jacinto Mountains, 21 Jun 1960, E.L. Sleeper, 1 ♂ (00077157) (CAS). Idyllwild, San Jacinto Mountains, 33.78389°N 116.95778°W, 17 Jun 1940, unknown, *Ceanothus* sp. (Rhamnaceae), 1 ♀ (00077201) (CAS). Poppet Flat, 33.85°N 116.85167°W, 01 Jun 1940, R.L. Usinger, 1 ♂ (00079159), 1 ♀ (00079162) (UCB); 01 Jun 1940, unknown, 1 ♂ (00079160), 1 ♀ (00079161) (UCB). Riverside, 33.95333°N 117.39528°W, 02 May 1935, C.M. Dammers, 1 ♂ (00077184) (CAS). San Bern. Nat. Forest, Thomas Mountain, T6S R3E S16, 33.61972°N 116.67944°W, 1320 m, 06 May 1997, H.W. Park, 1 ♂ (00082488) (UCR). San Jacinto Mts., 2.5 mi SE Poppet Flat, 33.82434°N 116.82078°W, 02 Jun 1940, H.T. Reynolds, *Ceanothus* sp. (Rhamnaceae), 1 ♂ (00079138), 2 ♀ (00079139, 00079140) (UCB). San Jacinto River Canyon, San Jacinto Mountains, 33.78389°N 116.95778°W, 30 May 1940, D.J. Raski, 1 ♀ (00079156) (UCB). **San Bernardino Co.:** Jct I-15 & Rt 138, 34.31229°N 117.47513°W, 1250 m, 26 Jun 1980, R.T. Schuh, *Rhamnus crocea* Nutt. (Rhamnaceae), det. B. Ertter, 2 ♀ (00058520, 00058521) (AMNH). Mill Creek, San Bernardino Mountains, 34.0835°N 116.89461°W, 30 Jun 1936, unknown, *Rhamnus californica* (Rhamnaceae), 1 ♀ (00082498) (UCR). Mojave R. Forks Hesperia, 10 km SE, 34.42639°N 117.3°W, 06 May

1986, Tadashi Nitta, 1 ♂ (00082487) (UCR). Ontario, San Antonia Canyon, 34.06406°N 117.65289°W, 25 Jul 1907, unknown, 1 ♀ (00068793) (USNM). San Bernardino, 34.08861°N 117.27972°W, 28 Apr 1971, E.L. Paddock, *Ceanothus rigidus* (Rhamnaceae), 1 ♂ (00073776), 1 ♀ (00073777), 5 nymphs (00073778–00073782) (CAFA). *Ceanothus rigidus* (Rhamnaceae), 1 ♂ (00068784), 1 ♀ (00068785) (USNM). **San Diego Co.:** 1 mi W of Mt. Palomar, 38.3605°N 116.8724°W, 23 Jun 1962, J.F. Lawrence, 1 ♀ (00079137) (UCB). Morena Dam, 32.78083°N 117.20694°W, 26 May 1929, C.C. Sarl, 1 ♂ (00075954) (ORSU). Mount Laguna, 32.87222°N 116.4175°W, 21 Jun 1963, J. Powell, *Ceanothus integerrimus* (Rhamnaceae), 1 ♀ (00079164) (UCB); 21 Jun 1963, H.L. Griffin, 1 ♀ (00079163) (UCB). Palomar Mountain, 33.36333°N 116.83528°W, 28 Jun 1963, J. Powell, 1 ♂ (00079141) *Prunus emarginata* (Rosaceae), 2 ♂ (00079135, 00079136), 2 ♀ (00079130, 00079131) (UCB); 28 Jun 1963, C.H. Frady, 1 ♀ (00075968) (ORSU); 28 Jun 1963, N. Sakdapolrak, 1 ♂ (00079134), 4 ♀ (00079128–00079129, 00079132–00079133) (UCB). San Diego, 32.71528°N 117.15639°W, 28 Apr 1935, C.M. Dammers, 1 ♂ (00077159) (CAS). **San Luis Obispo Co.:** Tassajara Creek 7 mi N San Luis Obispo, 35.37986°N 120.6601°W, 04 Jun 1971–05 Jun 1971, J.D. Pinto, 1 ♂ (00082502), 1 ♀ (00082503) (UCR). **Santa Barbara Co.:** Figueroa Park, Santa Barbara National Forest, 34.43726°N 119.70513°W, 03 Jun 1919, Ralph Hopping, 1 ♂ (00077190) (CAS). **Santa Clara Co.:** S end of Mines Road, Santa Clara County, 37.35417°N 121.95417°W, 716 m, 23 Apr 1972, H.B. Leach, *Ceanothus cuneatus* (Rhamnaceae), 5 ♂ (00077160–00077164), 2 ♀ (00077165, 00077166) (CAS). **Shasta Co.:** 13 mi E Bartle, 41.12751°N 121.64056°W, 1237 m, 09 Jul 1980, G.M. Stonedahl, *Ceanothus integerrimus* (Rhamnaceae), 1 ♀ (00075960) (ORSU). 15 mi S McCloud, 41.03846°N 122.13833°W, 15 Jun 1975, R. Preserve, A.E. Hajek, 1 ♀ (00079180) (UCB). 3 mi East Lake Eiler, 37.17806°N 119.02611°W, 22 Jul 1947, T.F. Leigh, 1 ♀ (00079179) (UCB). 7.6 mi N of Manton, 40.54515°N 121.86889°W, 1138 m, 10 Jul 1980, G.M. Stonedahl, *Arctostaphylos* sp. (Ericaceae), 1 ♀ (00058582) (AMNH). Lassen Volcanic National Park, base of Summit Trail, 40.48111°N 121.38222°W, 2591 m, 16 Jul 1979, J.M. & J.M. Campbell, 1 ♀ (00071954) (CNC). **Siskiyou Co.:** 2 mi W of McCloud, 41.25583°N 122.17679°W, 1143 m, 26 Jun 1981, J.D. Lattin, 1 ♀ (00075958) (ORSU). 3.7 mi W of McCloud, 41.25583°N 122.20948°W, 1390 m, 09 Jul 1980, R.T. Schuh and G.M. Stonedahl, *Ceanothus cordulatus* Kell. (Rhamnaceae), det. J. Grimes, 1980, 2 ♂ (00058504, 00058505), 4 ♀ (00058506–00058509), 2 nymphs (00058510, 00058511) (AMNH); 09 Jul 1980, G.M. Stonedahl, *Ceanothus* sp. (Rhamnaceae), 1 ♀ (00075959) (ORSU). 4 mi E Mt. Shasta PO on Hwy. 89, 40.59941°N 122.41448°W, 1250 m, 22 Jun 1981, J.D. Lattin, *Pinus ponderosa* (Pinaceae), 1 ♂ (00075957) (ORSU). 4 road mi E of Shasta City, McBride Cmpgd, 40.59944°N 122.49083°W, 23 Jul 1962, D.C. Rentz and C.D. MacNeill, 1 ♂ (00077187) (CAS). 5 mi E of McCloud, 41.25579°N 122.04195°W, 07 Jul 1957, J. Powell, 1 ♀ (00079167) (UCB). 5 mi S of Weed, 41.35609°N 122.36048°W, 15 Jun 1959, Kelton and Madge, 2 ♂ (00071966, 00071967) (CNC). 5.4 mi W McCloud on Hwy 89, 41.25578°N 122.24241°W, 09 Aug 1980, G.M. Stonedahl, *Ceanothus* sp. (Rhamnaceae), 1 ♀ (00058581) (AMNH). Ash Creek Ranger Station, 9 mi E McCloud, 41.2975°N 121.94216°W, 1067 m, 07 Jun 1974–09 Jun 1974, J. Doyen, *Ceanothus cordulatus* (Rhamnaceae), 1 ♀ (00079171) (UCB). Black Butte Summit, 8 mi S of Weed, 41.30712°N 122.385°W, 1189 m, 22 May 1981, Lattin, 1 ♀ (00075962) (ORSU). McCloud, 41.25583°N 122.13833°W, 1090 m, 09 Jul 1980, G.M. Stonedahl, *Ceanothus* sp. (Rhamnaceae), 1 ♀ (00075965) (ORSU). McCloud, 41.25583°N 122.13833°W, 22 Jun 1914, E.C. Van Dyke, 1 ♂ (00068788) (USNM). Mount Shasta, 41.31°N 122.30944°W, 01 Jul 1975, E. Paddock, *Pinus* sp. (Pinaceae), 2 ♂ (00075951, 00075952) (ORSU). Mount Shasta City, 41.31°N 122.30944°W, 20 Jun 1958, J. Powell, 1 ♂ (00079142) (UCB). Mount Shasta City, 41.31°N 122.30944°W, 30 Jun 1937, B.P. Bliven, 1 ♂ (00077260), 1 ♀ (00077261) (CAS). Shasta Springs, 40.59944°N 122.49083°W, 19 Jun 1920, C.L. Fox, 2 ♂ (00077186, 00077192) (CAS). Snowman's Hill Summit, 5 mi E McCloud, 41.25579°N 122.04195°W, 1320 m, 13 Jun 1974, J. Powell, *Arctostaphylos* sp. (Ericaceae), 1 ♂ (00079177) (UCB). Young's Valley, Siskiyou county, 41.58333°N 122.51667°W, 1402 m, 03 Aug 1971, M. Butler, *Physocarpus capitatus* (Rosaceae), 1 ♀

(00075964) (ORSU). Yreka, 41.73556°N 122.63333°W, 12 Jun 1975, P. Oman, 1 ♀ (00075961) (ORSU). **Stanislaus Co.:** Del Puerto Cyn. Frank Raines Reg. Ok. Deer Tree Camp, 38.00222°N 120.13611°W, 22 May 1976, R. Kawin, 1 ♀ (00077262) (CAS). **Trinity Co.:** Coffee Creek, 41.10157°N 122.77786°W, 21 Jun 1934, G. & R. Bohart, 1 ♂ (00077189) (CAS). Hayfork Ranger Station, 40.55444°N 123.18194°W, 701 m, 23 May 1973, J. Powell, 1 ♀ (00079169) (UCB). Mountain Mdw. Rch. head Coffee Cr., 41.10306°N 122.77694°W, 1554 m, 08 Jul 1969, J. Powell, 1 ♀ (00079178) (UCB). **Tuolumne Co.:** Deadman Creek just E of vista point on Rt 108, 38.31292°N 119.74702°W, 2799 m, 27 Jul 1999, M.D. Schwartz, *Prunus subcordata* Benth. (Rosaceae), 1 ♀ (00071952) (CNC). Pinecrest, 38.18861°N 119.98972°W, 05 Jul 1942, R.E. Beer, 2 ♂ (00074874, 00074882) (KU). Strawberry, municipality of, 38.19833°N 120.00833°W, 15 Aug 1962, C. A. Toschi, 1 ♀ (00079175) (UCB). **Colorado: Denver Co.:** Denver, 39.73917°N 104.98417°W, 15 Jul 1900, N. Banks, 1 ♂ (00058522) (AMNH). **Larimer Co.:** 1 mi S of Poudre River on Pingree Park Road, 37 mi W of Fort Collins, 40.58313°N 105.78997°W, 2103 m, 14 Jul 1986, R.T. Schuh and J.T. Polhemus, *Cercocarpus montanus* Raf. (Rosaceae), 1 ♂ (00058562), 8 ♀ (00058563–00058570) (AMNH). Fort Collins, 40.58528°N 105.08389°W, 12 Jun 1900, unknown, 1 ♀ (00071973) (CNC). 1 ♂ (00068787) (USNM). Pingree Park road at jct. w. Colo. 14, 40.56111°N 105.59722°W, 14 Jul 1986, J.T. and D.A. Polhemus, *Cercocarpus montanus* (Rosaceae), 3 ♀ (00063506–00063508) (JTP). **Idaho: Butte Co.:** Craters of the Moon National Monument, 43.42972°N 113.53056°W, 13 Jul 1965, D.S. Horning, Jr., *Melilotus officinalis* (Fabaceae), 1 ♂ (00068803) (USNM). **Camas Co.:** Fairfield, 43.34667°N 114.79083°W, 24 Jun 1976, Knowlton, Cazier, 1 ♂ (00075355), 1 ♀ (00075354) (USU). **Caribou Co.:** Pine Bar Campground, 1 mi E Wayan on ID St rt 34, 42.97832°N 111.3563°W, 1829 m, 30 Jul 1981, M.D. Schwartz, *Purshia tridentata* (Rosaceae), 2 ♀ (00058583, 00058590) (AMNH). **Franklin Co.:** Cub River Canyon, 42.13601°N 111.69891°W, 26 Jun 1971, G.F. Knowlton and S.G. Cazier, 2 ♀ (00075352, 00075353) (USU). **Idaho Co.:** 20.7 mi WSW Lolo Pass, Squaw Creek, 45.41806°N 116.42366°W, 960 m, 22 Jul 1978, Nancy L. Herman, 1 ♀ (00058580) (AMNH). **Latah Co.:** Cedar Mountain, Moscow, 46.73112°N 117.00216°W, 06 Jul 1922, M.C. Lane, 1 ♂ (00068790) (USNM). Moscow Mountain, 46.80361°N 116.86778°W, 31 Jul 1972, L.A. Kelton, *Ceanothus* sp. (Rhamnaceae), 2 ♀ (00071955, 00071956) (CNC). **Oneida Co.:** 5 mi NW of Holbrook, 42.21305°N 112.72206°W, 08 Jan 1972, G.F. Knowlton, 1 ♀ (00079176) (UCB). **Owyhee Co.:** Silver City, 43.01694°N 116.73222°W, 1890 m, 08 Jul 1973, P.W. Oman, 1 ♀ (00075966) (ORSU). **Nevada: Carson City Co.:** Carson City, 39.16389°N 119.76639°W, 1829 m, 26 Jun 1929, R.L. Usinger, 2 ♂ (00077172, 00077173), 3 ♀ (00077179–00077181) gooseberry, 1 ♀ (00077174) (CAS). **Mineral Co.:** 27 mi SW of Hawthorne on Rt 359, 1 mi NE of Anchorite Summit, 38.24871°N 118.97506°W, 2256 m, 02 Jul 1983, R. Schuh, M.D. Schwartz, *Purshia glandulosa* Curran (Rosaceae), 11 ♂ (00058532–00058541, 00095990), 21 ♀ (00058542–00058561, 00095991) (AMNH). **Washoe Co.:** Peavine Mountain, 39.58556°N 119.93°W, 25 Jun 1986, J.B. Knight, *Ceanothus velutinus* Dougl. ex Hook (Rhamnaceae), 1 ♀ (00058519) (AMNH). Sooner Pass, 40.54347°N 119.97753°W, 1783 m, 12 Jul 1972, Oman, 1 ♂ (00075953) (ORSU). **Oregon: Clackamas Co.:** Mount Hood, 45.53806°N 121.56722°W, 1372 m, 26 Jun 1925, E.C. Van Dyke, 1 ♂ (00077193) (CAS). **Deschutes Co.:** 2 mi West of Paulina Lake, 43.72027°N 121.2948°W, 26 Jul 1939, Gray and Schuh, 1 ♀ (00058585) (AMNH). La Pine, 44.86139°N 117.08806°W, 02 Jul 1935, R.H. Beamer, 1 ♂ (00074881), 1 ♀ (00074884) (KU). Three Sisters Wilderness, T16 R8E Sec33, on snowfield on Middle Sister, 44.12987°N 121.7655°W, 2743 m, 29 Jul 1980, M.D. Schwartz, 2 ♀ (00058575, 00058576) (AMNH). **Jackson Co.:** Siskiyou Pass, 42.05056°N 122.60167°W, 08 Jul 1970, R.L. Westcott, 1 ♀ (00075963) (ORSU). **Josephine Co.:** 1 mi S of Rough and Ready Botanical Wayside, 42.08324°N 123.69209°W, 12 Jul 1979, M.D. Schwartz, *Lupinus* sp. (Fabaceae), 1 ♀ (00058588) (AMNH). **Klamath Co.:** 16 mi E of Dairy on Rt 140, 04 Jul 1982, T.J. Henry and G.M. Stonedahl, *Cercocarpus ledifolius* (Rosaceae), 3 ♀ (00177757–00177759) (USNM). Klamath Falls area above Geary Ranch, 42.28319°N 121.89225°W, 26 Jun 1959, Joe Schuh, 1 ♀ (00068995) (USNM). Siskiyou Summit on I5, 42.075°N 122.60583°W, 04 Jul 1982,

G.M. Stonedahl and T.J. Henry, *Ceanothus integerrimus* H. and A. (Rhamnaceae), 1 ♀ (00058577) (AMNH). Union Creek, Crater Lake, 42.94389°N 122.10556°W, 03 Jul 1952, M. Cazier, W. Gertsch, and R. Schrammel, 1 ♀ (00058584) (AMNH). **Lake Co.:** 15 mi SW Silver Lake T29S, R12E, S28, 42.97422°N 121.25552°W, 24 Jul 1957, G.F. Kraft, *Cercocarpus ledifolius* (Rosaceae), 1 ♀ (00075967) (ORSU). 28 mi SE Jct 97 & 31, 43.3766°N 121.20966°W, 1497 m, 25 Jul 1979, M.D. Schwartz, *Cercocarpus ledifolius* (Rosaceae), 2 ♀ (00058523, 00058524) (AMNH); 25 Jun 1979, G.M. Stonedahl, *Cercocarpus ledifolius* (Rosaceae), 2 ♂ (00075969, 00075970), 3 ♀ (00075971–00075973) (ORSU). 28 mi SE of La Pine on Rt 31, 43.3766°N 121.20966°W, 1535 m, 25 Jun 1979, R.T. Schuh, *Cercocarpus ledifolius* (Rosaceae), 1 ♀ (00058586) (AMNH). **Linn Co.:** Hoodoo Ski Bowl, 44.40917°N 121.87333°W, 1402 m, 25 Jul 1966, J. Powell, 1 ♀ (00079154) (UCB). **Union Co.:** 14 mi S of Union, 45.00621°N 117.86417°W, 1280 m, 30 Jun 1960, J.D. Lattin, *Ceanothus velutinus* (Rhamnaceae), 2 ♀ (00075976, 00075977) (ORSU). **Wheeler Co.:** 4.5 mi S of Mitchell on Summit Prairie Road, 44.50161°N 120.15222°W, 22 Jun 1979, M.D. Schwartz, *Ceanothus ledifolius* (Rhamnaceae), 3 ♂ (00058512–00058514), 3 ♀ (00058515–00058517) (AMNH). **Utah: Box Elder Co.:** Blue Creek, 41.86215°N 112.45691°W, 1432 m, 14 Jun 1932, G.F. Knowlton, 1 ♂ (00075351) (USU). **Garfield Co.:** Bryce Canyon National Park, 37.58333°N 112.21667°W, 06 Jun 1969, W.F. Chamberlain, 1 ♂ (00058088) (TAMU). **Juab Co.:** Kyne, Utah Agriculture Experiment Station, 39.64528°N 111.86917°W, 17 Jun 1933, G.F. Knowlton, 1 ♀ (00068797) (USNM). **Sanpete Co.:** Cottonwood creek 4.7 mi NE Fairview on 31, 0.5 mi W Nat'l For. Bd., 39.64849°N 111.38515°W, 2134 m, 12 Jul 1981, M.D. Schwartz, *Amelanchier utahensis* (Rosaceae), 2 ♂ (00058518, 00058574) (AMNH). **Sevier Co.:** Fish Lake, 38.56419°N 111.70611°W, 16 Aug 1929, R.H. Beamer, 1 ♀ (00074883) (KU). **Washington: Klickitat Co.:** 20 mi NE Goldendale, 46.02521°N 120.52673°W, 853 m, 12 Jun 1973, Oman and Musgrave, 1 ♂ (00075956) (ORSU). **Wyoming: Lincoln Co.:** Salt River Pass, 15 mi S of Afton on Rt 89, 42.54234°N 110.89431°W, 2326 m, 21 Jul 1981, M.D. Schwartz, *Ceanothus velutinus* Dougl. (Rhamnaceae), 1 ♂ (00005871), 2 ♀ (00005872, 00005873) (AMNH).

### *Teleorhinus tephrosicola* Knight

Figures 7, 9, 10, 12, 13; map 5; table 3

*Teleorhinus tephrosicola* Knight, 1923: 476 (new species, description), 1941: 52 (comments); Blatchley, 1926: 915 (key, redescription), 916 (redescription, distribution, host); Froeschner, 1949: 135 (redescription), 162 (distribution), 187 (figure); Carvalho, 1958: 180 (catalog); Wheeler, 1991: 429 (biol., host).

*Teleorhinus davis* Knight, 1923: 426 (claw), 1941: 19 (claw), 233 (index); Carvalho, 1958: 180 (catalog, note); error pro *tephrosicola* (Carvalho, 1958).

*Teleorhinus floridanus* Blachley, 1926: 915 (new species, description, key); Carvalho, 1958: 180 (catalog); Henry and Smith, 1979: 214 (list). NEW SYNONYMY.

*Teleorhinus utahensis* Knight, 1968b: 65 (new species, description). NEW SYNONYMY.

TYPE MATERIAL (EXAMINED): *Teleorhinus tephrosicola*: HOLOTYPE: Male: [USA: New York: Suffolk Co.] Yaphank [40.83667°N 72.9175°W], 11 Jul 1916, Wm. T. Davis, *Tephrosia* sp. (Fabaceae) (AMNH\_PBI 00068804) (USNM). ALLOTYPE: [New York: Suffolk Co.] Yaphank [40.83667°N 72.9175°W], 11 Jul 1916, Wm. T. Davis, 1 ♀ (00068901) (USNM). PARATYPE: [USA: New Jersey: Ocean Co.] Lakehurst [40.01444°N 74.31167°W], 17 Jun 1906, Wm. T. Davis, *Tephrosia* sp. (Fabaceae), 1 ♀ (00121394) (CNC).

*Teleorhinus floridanus*: HOLOTYPE: Male: [USA: Florida: Pinellas Co.] Dunedin [28.01972°N 82.77166°W, 9 m], 24 Apr 1920, W.S.B. (AMNH\_PBI 00068801) (USNM).

*Teleorhinus utahensis*: HOLOTYPE: Female: [USA: Utah: Millard Co.] Scipio [39.245°N 112.10333°W], 29 Jun 1965, H.H. Knight (AMNH\_PBI 00069001) (USNM). ALLOTYPE: [Utah: Millard Co.] Scipio [39.245°N 112.10333°W], 29 Jun 1965, H.H. Knight, 1 ♂ (00068899) (CNC). PARATYPES: [USA: New Mexico: Sandoval Co.] Jemez Springs [35.76861°N 106.69167°W, 1951 m] 17 Jul 1916 (00121391) (CNC). 1 ♂ (00068900) (USNM). County and date unknown 1 ♀ (00121390) (CNC).

DIAGNOSIS: Recognized by vesica beyond secondary gonopore bent and tapering into point (fig. 9) and head more elongate than in *T. crataegi* and *T. tephrosicola* (fig. 7); less than proximal half of second antennal segment inflated (fig. 7); second antennal segment not twice as long as length of the pronotum (table 3); dull appearing area below eye broad band (fig. 7), phallosome short, stout (fig. 9); left paramere with anterior process round apically, posterior process slightly pointed (fig. 9); right paramere strongly curved (fig. 9).

REDESCRIPTION: *Male*: Total length 5.99–7.41, length apex clypeus-cuneus fracture 4.61–5.54, width across pronotum 1.51–1.74. COLORATION: Labium with first to third segment yellowish brown, fourth segment dark brown; coxae bright yellow, brown basally; trochanter brownish; femora red-orange, sometimes very brightly colored; tibia yellowish brown; first and third tarsal segments brown, second segment usually lighter. SURFACE AND VESTITURE: General aspect strongly shining; dorsal surface including antennal segments clothed with short, black, reclining setae; dull appearing area below ventral margin of eye wide (fig. 7). STRUCTURE: Elongate ovoid; labium reaching mesocoxae; vertex flat. GENITALIA: Vesica with apical part beyond secondary gonopore concave basally and flattened apically (fig. 9); phallosome short, stout (fig. 9); left paramere with anterior process round apically, posterior process slightly pointed (fig. 9); right paramere strongly curved (fig. 9).

*Female*: Total length 6.01–7.15, length apex clypeus-cuneus fracture 4.65–5.72, width across pronotum 1.54–1.77. Coloration, surface, vestiture, and structure as in male, except second antennal segment more widened distally; inflated distal part of second antennal segment distinctly shorter than narrow proximal part (fig. 7); more strongly ovoid than male. GENITALIA: Sclerotized rings of dorsal labiate plate distinctly elongate, distinctly pointed apically (fig. 11); posterior wall with spinose field on surface; sclerotized part of posterior wall with round lobe medially (fig. 12).

HOSTS: *Arctostaphylos pringlei* (Ericaceae), *Tephrosia* sp. (Fabaceae), *Quercus arizonica* Q. *turbinella* (Fagaceae), *Rhamnus crocea ilicifolia* (Rhamnaceae), *Cercocarpus* sp., and *C. montanus* (Rosaceae).

DISTRIBUTION: Distributed throughout the United States (map 5).

DISCUSSION: The sensory bulb on the second valvifer of *Teleorhinus tephrosicola* (fig. 13A, B) is shown here for the first time in a scanning electron micrograph. This structure is not unique to Pronotocrepini, but is also found in other mirids. The function of this structure is not clear. The surface structure of the posterior wall of *T. tephrosicola* is highly sculptured with denticlelike outgrowths (fig. 13C–E). A confocal micrograph is shown in figure 13F.

Blatchley (1926) described *Teleorhinus floridanus* from three specimens collected in Dune-din, Florida. He distinguished *T. floridanus* from *T. tephrosicola* by the length of the second antennal segment being equal to the combined lengths of the third and fourth compared to *T. tephrosicola* with the third and fourth antennal segments slightly longer than the second; and

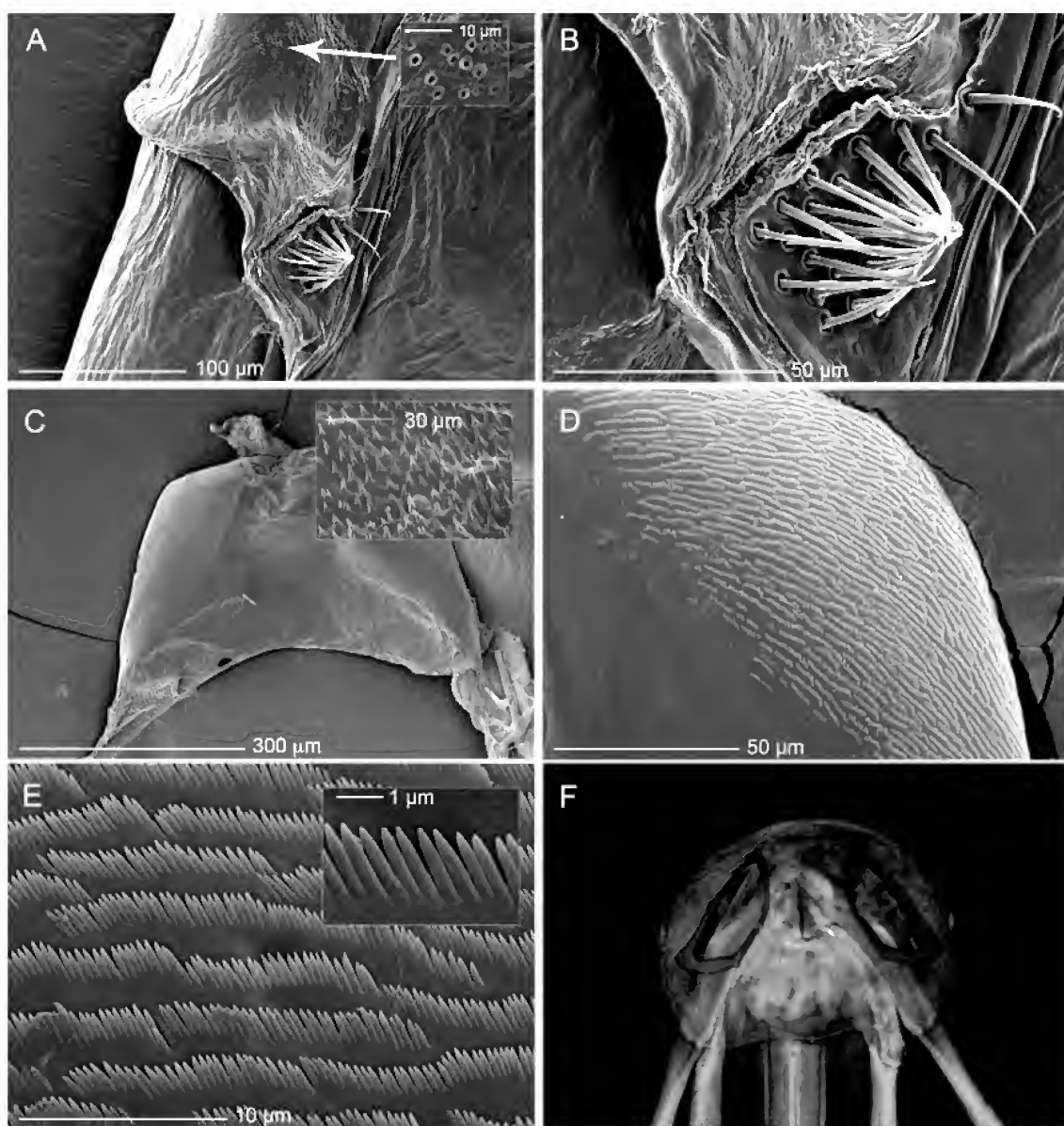


FIGURE 13. Scanning electron micrographs of *Teleorhinus tephrosicola* (female). A, B. Sensory bulb of second valvifer (lateral view), with detail of sensory openings (arrow). C, D. Posterior wall, with detail of surface structure (ventral view). E. Detail of posterior wall. F. Confocal laser scanning micrograph of female genitalia (dorsal view).

by the steel-blue color of the dorsal surface of *T. floridanus*. My comparison of the types of *T. floridanus* and *T. tephrosicola* suggests that the two are conspecific. I am, therefore, treating the former as a junior synonym of the latter, new synonymy.

Knight (1968b) distinguished *Teleorhinus utahensis* from *T. tephrosicola* by the former having only the apical two-fifths of the second antennal segment inflated. Examination of type series of *T. utahensis* suggests the antennal structure of this nominal species is similar to that

found across the geographical range of *T. tephrosicola*, and I am therefore treating the former as a junior synonym of the latter, new synonymy.

In his original description Knight (1923) mentioned that the type specimens of *Teleorhinus tephrosicola* were collected by Mr. Davis on flowers of *Tephrosia* sp. Blatchley (1926: p. 916) in his work on the eastern North American Heteroptera wrote that the only known specimens of *T. tephrosicola* were taken by Davis on flowers of the common goat's rue *Cracca virginiana* L. The source of his information is not clear.

In several publications the species name *davisi* is mentioned (Knight, 1923, 1941; Carvalho, 1958). Knight's (1941) reference is listed by Carvalho (1958) as "error pro *tephrosicola*" and as synonym of *tephrosicola*.

**SPECIMENS EXAMINED:** **USA: Arizona: Apache Co.:** Lukachukai Mountains, 36.48444°N 109.20371°W, 23 Jun 1936, E.D. Ball, 1 ♂ (00068896) (USNM). Lukachukai Mountains, 36.48444°N 109.20371°W, 23 Jun 1936, E.D. Ball, 1 ♀ (00068886) (USNM). **Gila Co.:** 8 mi SW jct Rts 87 and 188 (off Rt 87), Tonto National Forest, 33.55989°N 111.21341°W, 1219 m, 27 May 1983, R.T. Schuh and G.M. Stonedahl, *Quercus turbinella* Greene (Fagaceae), 1 ♂ (00095988), Light Trap, 5 ♂ (00095979, 00095982–00095983, 00095987, 00095989), 1 ♀ (00095984), 1 ♀ (00095980) (AMNH). Old CCC Campground S of Globe on Pioneer Pass Rd, 33.39417°N 110.78583°W, 1433 m, 30 May 1983–31 May 1983, R.T. Schuh, G.M. Stonedahl, B.M. Massie, Light Trap, 1 ♀ (00095985) (AMNH). Sierra Ancha, Parker Cr., 33.95754°N 111.18679°W, 11 May 1947, H. & M. Townes, 1 ♀ (00068888) (USNM). **Maricopa Co.:** Four Peaks Road, mile 17, 33.63944°N 111.36444°W, 1191 m, 24 May 1982, J.T. Polhemus, 1 ♂ (00064074), 3 ♀ (00064072, 00064076, 00064078) *Cercocarpus* sp. (Rosaceae), 1 ♂ (00064069) (JTP). **Mohave Co.:** Hualapai Mountains, 34.9°N 113.88388°W, 04 Jul 1937, D.J. & J.N. Knull, 1 ♀ (00068887) (USNM). Hualapai Mountains, SE of Kingman, T20N R15W, 35.18944°N 114.05222°W, 1585 m, 09 Jun 1983, R.T. Schuh, M.D. Schwartz, G.M. Stonedahl, *Quercus* sp. (Fagaceae), 1 ♀ (00095992) (AMNH). **Navajo Co.:** 15–20 mi SW of Show Low, 34.04972°N 110.27592°W, 1707 m, 30 May 1983, Schuh, Stonedahl, and Massie, *Quercus arizonica* Sarg. (Fagaceae), 1 ♂ (00095978) (AMNH). **Yavapai Co.:** 5 mi N of Wilhoit N of Kirkland, 34.49811°N 112.58611°W, 1400 m, 19 Jun 1980, R.T. Schuh, *Quercus turbinella* Greene (Fagaceae), det. B. Ertter 1980, 1 ♀ (00095977), Light Trap, 1 ♀ (00095986) (AMNH). **California: Santa Clara Co.:** Santa Cruz Mountains, 37.11055°N 121.84444°W, C.V. Riley, 1 ♀ (00068890) (USNM). **Siskiyou Co.:** Macdoel, 41.82694°N 122.00417°W, 12 Jun 1960, E. Ball, 1 ♂ (00077683) (CAS). **Colorado: Douglas Co.:** Daniels Park, 39.48139°N 104.92528°W, 15 Jul 1982, J.T. Polhemus, 1 ♂ (00064070) (JTP). Perry Park, 39.25667°N 104.99194°W, 15 Jul 1983, J.T. Polhemus, 5 ♀ (00064077, 00064081–00064083, 00064085) (JTP); 08 Jul 1982, J.T. Polhemus, 1 ♀ (00064079) (JTP); 15 Jun 1979, J.T. Polhemus, 1 ♂ (00064067) (JTP). Roxborough Park Road near Chatfield State Park, 39.47389°N 105.08472°W, 1707 m, 08 Jun 1983, J.T. Polhemus, 1 ♀ (00064084) (JTP). Waterton, 39.49361°N 105.08806°W, 15 Jun 1981, J.T. Polhemus, 1 ♂ (00064075) *Cercocarpus montanus* (Rosaceae), 1 ♂ (00064080) (JTP). Waterton, Head of Hilina, 39.49361°N 105.08806°W, 17 Jun 1980, J.T. Polhemus, 1 ♀ (00064071) (JTP). Near Waterton, Roxborough Road, 39.49361°N 105.08806°W, 1707 m, 25 Jun 1981, D.A. Polhemus, 1 ♂ (00064073) (JTP). **La Plata Co.:** Durango, 37.27527°N 107.88°W, 02 Jul 1937, R.H. Beamer, 1 ♀ (00074912) (KU). **Montrose Co.:** 18 mi SE of Naturita, 38.03432°N 108.33444°W, 08 Jul 1980, J.T. and D.A. Polhemus, 1 ♂ (00064068) (JTP). **Florida: Highlands Co.:** Archbold Biological Station, 27.18833°N 81.33778°W, 27 Apr 1967, S.W. Frost, 1 ♂ (00068897) (USNM). **Volusia Co.:** South Daytona, 29.16556°N 81.00472°W, 17 Apr 1959, J.F. Brimley, 1 ♂ (00072073) (CNC); 10 Apr 1961, J.F.B., 1 ♀ (00072074) (CNC); 18 Apr 1966, J.F. Brimley, 1 ♀ (00072075) (CNC). **Seminole Co.:** Sandford, 17 Apr 1927, E.D. Ball, 1 ♀ (00121389) (CNC). **Missouri: Crawford Co.:** Steelville, 37.9681°N 91.35487°W, 01 Jun 1938, R.C. Froeschner, 1 ♂ (00121392) (CNC).

(Ulmaceae), 1 ♀ (00068891) (USNM). **Maries Co.:** Vichy, 38.11143°N 91.76044°W, 17 Jun 1939, R.C. Froeschner, 1 ♂ (00121393) (CNC). **Nevada: Lincoln Co.:** Highland Range near Mendha, 37.89361°N 114.57861°W, 2844 m, 04 Jul 1965, W.F. Barr, 1 ♂ (00086634) (UID). **New Jersey: Burlington Co.:** Pemberton, 39.97194°N 74.68277°W, 17 m, 06 Jul 1914, H. Seammel, *Quercus* sp. (Fagaceae), 1 ♀ (00068895) (USNM). **Ocean Co.:** Lakehurst, 40.01444°N 74.31167°W, 16 Jun 1950, H.G. Barber, 2 ♀ (00068892, 00068898) (USNM). **New Mexico: Lincoln Co.:** Ruidoso, 33.33166°N 105.67277°W, 26 Jun 1940, R.H. Beamer, 1 ♀ (00074914) (KU). **Otero Co.:** Cloudcroft, 32.95722°N 105.74222°W, 3218 m, 28 Jun 1932, R.H. Beamer, 1 nymph (00074913) (KU). **New York: New York Co.:** New York, 40.71417°N 74.00639°W, 15 Jun 1945, P. Vaurie, 1 ♀ (00059313) (AMNH). **Queens Co.:** Rockaway Beach, Long Island, 40.57138°N 73.85138°W, 24 Aug 1910, C.E. Olsen, 1 ♀ (00068893) (USNM). **Suffolk Co.:** Brookhaven, 40.77916°N 72.91527°W, 2 m, 21 Jun 1978, R.T. Schuh, Light Trap, 1 ♀ (00095981) (AMNH). **North Carolina: Moore Co.:** Southern Pines, 35.17389°N 79.3925°W, 159 m, 06 May 1910, A.H. Manee, 1 ♀ (00077684) (CAS). **Oregon: Jackson Co.:** Emigrant Lake, 42.16138°N 122.60416°W, 684 m, 28 Jun 1967, S.M. Hogue & R.L. Penrose, 1 nymph (00086609) (UID). **Pennsylvania: Centre Co.:** State College, 40.79333°N 77.86028°W, 15 Jun 1975, D.D. Wilder, 1 ♂ (00068894) (USNM). **Texas: Wheeler Co.:** 14 mi SW of Wheeler, Jct. FM453 & 2473, 35.35583°N 100.42694°W, 30 May 2002, J.C. Schaffner, 1 ♀ (00092744) (TAMU). **Wood Co.:** 16 mi N Hawkins, 32.82052°N 95.20389°W, 09 May 1999, A. Gillogly, W. Godwin, E. Riley, 1 ♀ (00092745) (TAMU).

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